REPORT RESUMES

ED 020 590 EC 000 575

EDUCATIONAL PROBLEMS AND PLANNING FOR GIFTED STUDENTS--SELECTED PAPERS FROM GRADUATE LEADERSHIP TRAINING PROGRAM ON THE GIFTED.

BY- GALLAGHER, JAMES J. AND OTHERS

ILLINOIS UNIV., URBANA, INST.RES.EXCEPT.CHILDREN

ILLINOIS STATE OFF. SUPT. PUB. INSTR., SPRINGFIELD

PUB DATE 66

EDRS PRICE MF-$0.75 HC-$5.84 144P.

DESCRIPTORS- *EXCEPTIONAL CHILD RESEARCH, *GIFTED, DISADVANTAGED YOUTH, LEADERSHIP TRAINING, GRADUATE STUDY, SEX DIFFERENCES, RACIAL DIFFERENCES, INTELLIGENCE DIFFERENCES, SOCIAL MOBILITY, SOCIAL STRUCTURE, HONORS CURRICULUM, STUDENTS, ELEMENTARY SCHOOL STUDENTS, ACADEMIC ACHIEVEMENT, PERSONALITY, SELF CONCEPT, LANGUAGE DEVELOPMENT, VERBAL ABILITY, IDENTIFICATION, SUMMER WORKSHOPS, SOCIAL STUDIES, CURRICULUM DEVELOPMENT, VALUES, SOCIOMETRIC TECHNIQUES, LOGIC, RESEARCH PROJECTS, LOGICAL THINKING,

SEVEN ARTICLES FROM THE INSTITUTE FOR RESEARCH ON EXCEPTIONAL CHILDREN CONSIDER THE GIFTED CHILD. THE FIRST ARTICLE, "LEADERSHIP TRAINING FOR THE GIFTED--A GRADUATE PROGRAM," IS BY J.J. GALLAGHER, DIRECTOR OF THE PROGRAM. SIX RESEARCH AND DEVELOPMENT PAPERS BY GRADUATE STUDENTS FOLLOW--"THE VARIABLE OF RACE, SEX AND INTELLIGENCE RELATED TO SOCIAL CHOICES OF DIADVANTAGED, GIFTED CHILDREN" BY V. GODMAN, "HONORS PROGRAM STUDENTS--THEIR ACADEMIC ATTAINMENTS, PERSONALITY TRAITS AND SELF CONCEPTS" BY W.D. SIMMONS, "AN ANALYSIS OF THE VERBAL DEFINITIONS OF ELEMENTARY SCHOOL CHILDREN--A PILOT STUDY" BY M. WEISER, "EVALUATION OF A SUMMER WORKSHOP ON GIFTED CHILDREN" BY F. SHAFFER, "DEVELOPING A SOCIAL STUDIES CURRICULUM FOR TEACHING VALUES IN THE ELEMENTARY SCHOOL" BY M. SCHEVERS, AND "THE DEVELOPMENT OF A PROGRAM OF SENTENTIAL LOGIC FOR GIFTED STUDENTS" BY K.A. RETZER. THE STUDENT PAPERS ALL PROVIDE FIGURES, TABLES, AND REFERENCE LISTS. (JD)

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EDUCATIONAL PROBLEMS AND PLANNING FOR GIFTED STUDENTS: SELECTED PAPERS FROM GRADUATE LEADERSHIP TRAINING PROGRAM ON THE GIFTED

James Gallagher
Verna Godman
Kenneth Retzer
Mary Schevers
Faye Shaffer
Wilber Simmons
Margaret Weiser

Institute for Research on Exceptional Children
University of Illinois
1966

Supported by the Department of Program Planning for the Gifted
Herbert Baker, Director
Office of Superintendent of Public Instruction
Springfield, Illinois

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U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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Preface

The volume presents some research and development work of six students in a graduate training program in the education of gifted students at the University of Illinois. The selections are as diverse as the interests of these students, but all represent interesting approaches to the multifaceted problems of gifted children.

The first article by the program director gives a brief description of the program whose structure represents an innovation in graduate education training. The next three offerings are devoted to research problems.

Verna Godman presents a unique investigation related to social choices within racially integrated program of talented students.

Wilber Simmons explored the personality and attitudinal variables related to students leaving a college honors program.

Margaret Weiser conducted a pilot study of the language development of culturally disadvantaged and advantaged talented children at various levels in the elementary school.

One of the most frequently implemented, and least frequently studied, of educational practices is the summer workshop.

Faye Shaffer has taken a closer evaluative look at one such attempt for teachers of gifted children at the elementary school level.

One area of great need in the education of gifted students are curriculum materials of sufficient stature and challenge to meet their advanced intellectual development.

Mary Schevers presents some ideas on the difficult, and consequently often ignored, subject on how to teach for values.

Kenneth Retzer contributes some initial ideas on a sequence of logic lessons for upper elementary and junior high students which is undergoing continued development.

In total, these offerings give evidence of the adventuresome nature of these students who shunned the easy and prosaic in order to struggle with meaningful issues.

JJG

Leadership Training for the Gifted: A Graduate Program

James J. Gallagher

Institute for Research on Exceptional Children
University of Illinois

The decade that encompassed the late 1950's and early 1960's showed dramatic changes in the nature and extent of educational interest in the problems of gifted children. The attention of earlier decades was focused primarily on administrative devices such as ability grouping and acceleration. Little interest was manifested in differential curriculum or pedagogy applied to gifted students, and, as a result, little emphasis was placed on special training for this area.

Two major thrusts of educational innovation have changed this picture and began both inside and outside the educational profession. Aside from the outside pressures of the cold war which focused attention on the nation's talented, the most important development for gifted children was the initiation of large national curriculum projects, spawned originally by physical scientists and mathematicians. These specialists stressed the teaching of the structure of the discipline and an expected student posture of an active learner who was involved in the same kinds of research activities that the professional in the field engages in.

The second major area of innovation has taken place within the education profession as a result of the recognition of the need for adaptive or creative citizens in a changing society. Emphasis has been placed on training students to discover concepts on their own, or to use inquiry training methods to strengthen student strategies purported to lead to creative thinking. Both of these areas of innovation have increased the pressure for special training of personnel to provide competent leadership in the new area of program development for the gifted.

It is sometimes necessary to remind ourselves that, even in a democracy where all individuals are equal before the law, that their lives and behavior do not have equal impact on their fellow citizens. The highly educated and professionally trained persons have an influence far beyond their limited numbers. The worth of one physician to a community cannot be measured in terms of twenty or one hundred untrained citizens. The value of the physician who trains other physicians is equally apparent.

It is precisely this type of highly trained and devoted specialist that is needed in programs for gifted students and in which they are in shortest supply. This is an inevitable consequence accompanying the initiation of any new program but one that should be remedied as quickly as possible. It cannot be stressed too strongly that no amourt of lesser trained persons can make up for the lack of the knowledgeable leader.

If a person is a competent administrator, he may not know the special curriculum problems related to gifted children; if he is a psychologist with a long and successful work history with gifted children, he may be short on administrative and supervisory experience; if the person has been a good elementary teacher with years of experience, he may still lack special content knowledge in certain fields.

One approach that can provide substantial assistance to gifted programs is to prepare a small corps of professionals, seasoned by experience and motivated by a commitment to education of the gifted as a career. Such persons in positions of supervision, inservice training and leadership rcles can provide an influence far exceeding their actual numbers.

These consultants or specialists can gather around them teams of teachers and pass on new ideas through demonstration and further instruction. Their encouragement and support is sometimes all that is required to release a teacher from his own timidity and concern about the use of new ideas, no matter how attractively they might have been packaged by research persons or university professors.

The group of participants in this Institute was small but it would be expected that their influence on the Illinois program would be large. The persons attending this Institute would be expected eventually to take positions as state consultants, or as leaders of programs in large communities, or in counties in rural districts. It is important for such persons to feel secure in their own knowledge and competencies. Such confidence can be engendered by a well planned program of academic study and practicum experience.

Selection of Institute Personnel

The selection of quality personnel for such a program is an absolute must. As in athletics, the selection of talented personnel is probably as important as the training they receive. Therefore, applicants to an Academic Year Institute of this type should fulfill certain criteria of high standards. There is probably no better way to destroy the reputation of a program than to start with indifferent standards.

Ability Level. Students take an established measure of graduate aptitude work such as the Miller Analogies Test or the Graduate Record Examination. Their scores on these tests should compare favorably with students doing advanced graduate work. While little or no research information is available on the intellectual potential needed for those working successfully with gifted children, it is rare to find a person who has achieved some success in this field who does not immediately impress persons with his alertness, intellectual ability and enthusiasm.

Experience. Persons entering this program should have at least four years of successful experience in the public school systems. This experience could be obtained as a teacher, psychologist, counselor, administrator, etc.

The combination of high ability and successful experience would guarantee a core of personnel that could provide leadership to the schools, not only in their supervision and consultant capacity, but in their inservice training programs in which they could disseminate the best of current knowledge available in this area.

Commitment to Illinois Program for Gifted Children. Priority was given to persons who have already shown a commitment to the Illinois Program. This would include persons working in Demonstration Centers, specialists hired in school systems for work in this area and persons with the ability and interest to become state consultants or teacher educators.

Institute Program

The key to the Institute programming was diversity. Each of the Institute members had a program designed for him on the basis of his needs and background. This diversity of approach recognizes the fact that competence in several fields of knowledge and experience will be demanded of leaders in this field. Each program was designed to strengthen areas of maximum need.

The following knowledge and skill areas were those which seemed to have the greatest bearing upon successful operation and needed coverage either through past or present training and experience.

Developmental Processes and Individual Differences. One of the first goals of the program should be to help the aspiring consultant or specialist to a full realization of the meaning of superior intellectual development and understanding of the impressive range of individual differences. In order to accomplish this, certain experiences in the area of test and measurements would be required, not so much to establish professional skills in this area, but rather to experience first hand the measurement concepts without which the person cannot have a full understanding of the term 'giftedness' and its limitations.

Another experience of benefit for the student was a course which stressed a study of all deviant children, thus giving the student a portrait of the full range of abilities and disabilities so that they gain some appreciation of how gifted children stand with regard to other extremes. Finally, some specific instruction was provided in the field of gifted children--their problems, and the variety of educational procedures available to solve these problems through informal seminars.

Content Specialty. A person who is a consultant or coordinator for gifted children must be an expert in many respects of the word. But in addition, it seemed important that he have a considerable grasp of at least one of the many areas of content information. In order to help establish a content specialty, no fewer than two units of graduate credit were required in a content specialty chosen by the student and his advisor. This year, the content area specialists of the seven Institute members were in sociology, mathematics and literature.

Pedagogy Specialty. No matter how knowledgeable the person is in a content area specialty, the consultant or coordinator needs to be intimately aware of how such information can be organized and best presented to stimulate independent and productive thinking on the part of the gifted student.

A background in curriculum development, supervisory techniques and special methods of presenting materials for maximum learning efficiency of the gifted student is necessary. This emphasis is based on the assumption that the gifted student not only needs to know the wisdom of past ages, but also needs to gain practice in the methods of scholars so that he, in turn, may better add to that knowledge in the future.

Administration and Supervision. Much of the work of leaders in this area involves the transmission of information and the stimulation of interest of others from a leadership position. It is essential, therefore, that they have some grounding in the foundations of supervisory and administrative procedures. Courses and field study opportunities were provided in this general area.

Directed Independent Study. One special feature of the Institute was the use of independent study as an integral part of this program. It would be both impossible and unwise to attempt to meet with organized coursework, all of the diverse demands or individual needs of the students in such a program. It is important and necessary for the student to have the freedom to explore problems of special interest under competent supervision. Just as we stress the necessity for greater independence in the gifted students, we must in our own training program, allow these persons the necessary freedom for explorations of their own. For that reason, time was set aside for supervised independent study.

Field Experience. It would seem essential for these persons to be in continual touch with ongoing programs for gifted children throughout their stay at the University. Such continued contact served to relate theory to practical situations and allow application of ideas in the kind of situations that will be akin to their own working environment. The development of demonstration centers throughout the State of Illinois to demonstrate the best in educational practices for gifted students provided the environment for just such an experience. While the student was obtaining the theoretical and practical knowledge which forms the heart of this program, supervised visits and systematic observations at the demonstration centers added some integration to the more abstract concepts and teaching methods met during the academic portion of the training program.

The goal of this program was to attempt to establish minimum competencies in all of these areas and to provide strength in those areas not covered in the student's training to date. Each student would have a program designed individually to fit his own past training and future aspirations.

Example of Student Program

One example of the type of schedule followed in the fellowship program is listed below. These were actual activities of one fellow enrolled in the Academic Year Institute of 1964-1965.

Course Work

Fall -	Educ.	392	Introduction to the Problems of Measurement
	Educ.	417	Psychoeducational Problems of Exceptional Children
	Educ.	316	The Gifted Child in School and Society
	Soc.	300	Social Systems and Institutions
Spring-	Educ.	343	Individual Intelligence Testing
	Educ.	464	Field Problems in Educational Administration (program evaluation)
	Educ.	449	Independent Study (study of roles perceived by teachers and by students)
	Soc.	414	Social Interaction Seminar

Field Work

Attended meetings of Demonstration Center Directors in Edwardsville, Quincy, Elk Grove and Chicago.

Attended Advisory Council meeting.

Visited Decatur Program for culturally disadvantaged gifted.

Engaged in evaluation of Urbana Program for the Gifted.

Seminars

Noncredit seminar in classroom interaction analysis.

Academic Year Institute seminar.

Vocational Goal

Administration or teacher education in the area of gifted children.

Special Training Experiences in the 1964-1965 Program

In addition to the regular academic program, a number of special experiences were provided for this year's Institute members. These or similar experiences would be continued into the next year.

Seminar in Education of the Gifted. This seminar met weekly to consider, in depth, certain topics rarely touched on in formal course work but of importance to persons working in this field. For example, such topics were discussed as program evaluation and the many difficult problems involved in executing such evaluation, problems involved in identifying gifted children and designing and applying for a research grant. This seminar also served as the vehicle for bringing other faculty to the group to explain their programs and activities which bear on this general area.

Smith-Gallagher Seminar in Analysis of Classroom Interaction. This seminar was conducted weekly during the second semester and reviewed the ongoing research programs of Professors B. O. Smith and J. J. Gallagher. Each of these investigators has been studying the classroom environment with a view towards classifying teacher and student behavior. The two different systems (one of logical analysis and the other a cognitive processes analysis) were presented to the students and both research and practical application of these systems for teacher education and inservice training have been discussed.

Field Trips to Demonstration Centers. The Institute fellows this year had attended meetings of the Demonstration Center Directors through the cooperation of Dr. William Rogge who has been in charge of this part of the State program. These trips to a variety of demonstration centers have provided a first hand experience for the fellows to observe developing programs and their attendant advantages and problems. Their responsibilities have been to observe critically present practice and to present constructive suggestions for improvement of visitation procedures.

Program Evaluation - A Test Community. A subgroup of four members of the Institute under the supervision of Professors Robert Henderson and James Gallagher have taken on the responsibility of developing an evaluation procedure for one of the gifted programs in the State. It is hoped that the procedures and measuring techniques that were devised for this purpose could be utilized for more general application by other school systems interested in a procedure devised to approach the goal of continuous program improvements. A report of this operation will be submitted to the local school system while the methods and procedures will be submitted for possible use in the State program.

Since this program represents a type of pioneering venture into graduate training, there is every expectation that changes and modifications will be made with experience. A large eraser, and the willingness to use it, are two prerequisites for innovators in this or any area.

THE VARIABLES OF RACE, SEX AND INTELLIGENCE RELATED TO SOCIAL CHOICES OF DISADVANTAGED, GIFTED CHILDREN

Verna Godman

Champaign Public Schools

Purpose

In recent years there has been an increasing interest in the problems of racial segregation and discrimination, and their effects upon the personalities and accomplishments of those discriminated against. The harmful effects of such practices have led to efforts to desegregate educational facilities and promote the experience of learning in racially integrated classrooms. Yet, many still wonder if the children really do experience the absence of racial barriers because of the integrated setting; or if the racial groups merely exist, side by side, with little interaction. The sociometric study presented here attempts to deal with this question related to the choice of friends in racially integrated classrooms of culturally deprived, gifted children.

Background

Numerous sociometric studies of average and gifted children have found several different variables related to social choice and acceptance. Among the more prominent of these variables are age, grade, sex, race, socioeconomic status, memberships in religious or ethnic groups, intelligence, athletic ability, and personality factors.

In general, age, grade level and sex appears to be the most important determiners of a child's friendship choices (Campbell, 1964). Studies by Hollingshead (1949), Neugarten (1946), Bonner (1946) and Elkins (1958) have revealed that socioeconomic class plays an influencial role in determining a child's choice of friends. (Campbell, 1964) Stendler (1949) found that children tend to choose companions from their own socioeconomic level. When the sociometric criterion was confined to classroom situations this tendency was not as pronounced; however, most of the same children confined their choice of companions for out-of-school activities to those of similar socioeconomic class. Other studies have found that children choose companions from their own socioeconomic level or higher. (Gronlund, 1959) A few studies have produced contradictory findings showing little or no influence of social class upon sociometric choices. It has become evident that frequency of contact, ecological separation, and differences in value orientation are factors contributing to the amount of influence class and ethnic status have upon the child's choice of companions.

Actually, the typical patterns of residential segregation on the basis of social class, race and ethnic groups would tend to limit a child's experience of playing companions and friends to those of similar backgrounds, and reinforce tendencies to choose on the basis of social class, race or ethnic backgrounds similar to his own. Gronlund summarized numerous studies as follows, "... residential proximity has the greatest influence on friendship patterns at the elementary school level and (that) actual friendships are more influenced than are sociometric measures of desired associations." (p. 217)

Gronlund also maintains that, "Where racial cleavages exist in a community these cleavages are reflected in children's sociometric choices. However, where racial integration has been in effect for some time, children's sociometric choices freely cross race lines." (p. 218) Moreno (1934) and Criswell (1939) both found distinct racial groupings in their studies conducted in a large metropolitan area where segregation was common.

Raths and Schweikart (1946), in studying fifth and sixth graders found that both Negroes and white groups of children were accepted equally well by their classmates. The white children tended to be slightly higher in their acceptance of Negro children than the Negro children were of the white children. Gronlund found that fourth graders in a racially integrated classroom had a slight tendency to choose members of their own race for companions; however, "the sociometric results indicated that the pupils' choices freely crossed racial lines in both directions and that the Negro and white pupils were similar in the degree of social acceptance accorded them by their classmates." (p. 219)

Katz (1964) suggests that Negro children want friendships with white children of their won age, but he points out, "The bulk of early studies on the racial attitudes of white school children in the North indicated that from an early age they expressed strong preferences for their own racial group."

Intelligence and achievement have often been reported as important factors related to peer status. "In the area of skills and abilities, the picture continues to build up that the more intelligent are generally more accepted by their age mates; the slow learners and the retarded, less well accepted." (Campbell, 1964) Spaulding (1964) reviewed the literature on achievement and found both reading and arithmetic were correlated positively to social choice.

According to Gronlund, the correlation coefficients were low when achievement or intelligence test scores were compared to the sociometric status of pupils; however, comparison of the high and low status groups revealed significant differences in achievement or intelligence. Similarly, when high achievement or intelligence groups are compared with low achievement or intelligence groups, distinct differences in sociometric status were observed. A series of studies reported the tendency of children to choose other children of an intelligence range similar to their own. Thus, a gifted child placed within a group of children with below average intelligence, would very likely be an isolate. In a study by Gallagher and Crowder, the gifted children, who for the most part enjoyed high sociometric status, were from classrooms in which the children tended to have above average intelligence.

In general, several personal factors are important to high sociometric status: intelligence, achievement, physical maturity and ability, physical attractiveness, social skills, friendliness, and socially aggressive personality characteristics.

In regard to the study presented here, the relevance of some of these variables, such as intelligence, might be quite different from that expected from an advantaged class of gifted children. The variable of race might show a very definite relationship to companion choices and popularity in integrated classrooms of culturally disadvantaged children, especially in view of the fact that open verbalization of racial prejudice is often quite pronounced among the lower socioeconomic groups of white people.

The Problem of the Study

The purpose of this study was to investigate the relation of choice of seating, working and playing companions to race, sex and intelligence in four intermediate level classrooms of culturally disadvantaged, gifted children.

The following questions were raised:

1. Will the choices of seating, working and playing companions be made on the basis of the child's own racial group?
2. Will the choices of seating, working and playing companions be made on the basis of the child's own sex?
3. Will children with higher intelligence scores tend to receive the most choices within each classroom, and will those children with the lowest intelligence scores tend to receive the fewest choices?

Procedure

The 100 children involved in this study were enrolled in two schools which maintain classes for culturally disadvantaged, gifted children. The children were involved in an experimental program designed to evaluate the effectiveness of intensive home-school contacts with parents when provided in conjunction with a special educational program for socially and culturally deprived children with high potential.

> Two criteria (were) utilized to determine eligibility for children in the project: (1) the subjects (were) from homes classified as culturally deprived according to the fathers' occupation and housing ratings obtained through the City Planning Commissioner's Office, (2) children who (were) in the top 20 per cent of the culturally deprived population according to an individual psychological evaluation by a qualified psychological examiner in which creativity scores, intelligence quotients and intellectual functioning were considered. (Quoted from a paper prepared by the school system in which the study was made.)

The children were randomly assigned to the experimental group, receiving home visitations from the teachers in addition to the special program, or to the control group which received only the special program with conventional home-school contacts. The classes receiving the experimental treatment are located at school "A", while the control classes are at school "B". The children in this study were in the two intermediate classes at both schools, Intermediate I designating a classroom of 4th and 5th graders, and Intermediate II designating a classroom of 5th and 6th graders: AI (A school, intermediate I), AII (A school, intermediate II), BI (B school, intermediate I), BII (B school, intermediate II). Each child had been given a Stanford-Binet intelligence test (1960, L-M form), among other tests, as an aspect of involvement in the project.

In each classroom the homeroom teacher passed to each child a mimeographed instruction sheet with four half-sheet pages containing spaces to write five choices, and an alphabetical listing of the familiar names (first or "nicknames" and last names) of the members of the class. She then read the following directions aloud while the children read them silently.

> During the next few weeks we will be changing some seats, working in small groups, and playing some group games. Now that we all know each other by name, you can help me arrange groups that work and play best together. You can do this by writing the names of the children you would like to have sit near you, to have work with you, and to have play with you. You have been given an alphabetical list of the names of the children in this room. From this list, you may choose anyone in this room you wish, including those people who are absent today. Your choices will not be seen by any other pupils. Give the first name and the initial of the last name for each person you choose.

Make your choices carefully so the groups will be the way you really want them. I will try to arrange the groups so that each pupil gets at least two of his choices. Sometimes it is hard to give everyone his first few choices so be sure to make five choices for each question. On the last page, I would like to know the names of the pupils you think will want to sit near you.

Remember!

1. Your choices must be from pupils in this room, including those who are absent.
2. You should make all five choices for each question.
3. You should write the first name and the initial of the last name.
4. You may choose a pupil for more than one group if you wish.
5. Your choices will not be seen by any other pupils.

The choice of the three criteria was made on the basis of their generality and their reflection of actual possible situations which the children can take seriously, as recommended by Gronlund (1959). The use of three criteria was deemed necessary since, according to the same source, "...for evaluating interpersonal relationships and for determining the group acceptance of individual pupils several criteria are usually necessary." (p. 46) Five choices were requested of the child mainly for the sake of the teacher who would try to fulfill at least one of each child's choices. Only the first three choices were used in the data analyses, and, unfortunately, there were a few cases in which the children did not even record three choices for every item.

Results

Descriptive analyses consist mainly of the sociometric diagrams of the choices and mutual choices within each class. The usual sociometric pattern, as described by Gronlund (1959), in which the stars are placed toward the center and only mutual choices are shown, has been abandoned in favor of showing all choices, which included cross-race and cross-sex choices, and an attempt at grouping on the basis of all choices. The following symbols are used in each diagram

▨ Negro boy

□ White boy

◍ Negro girl

○ White girl

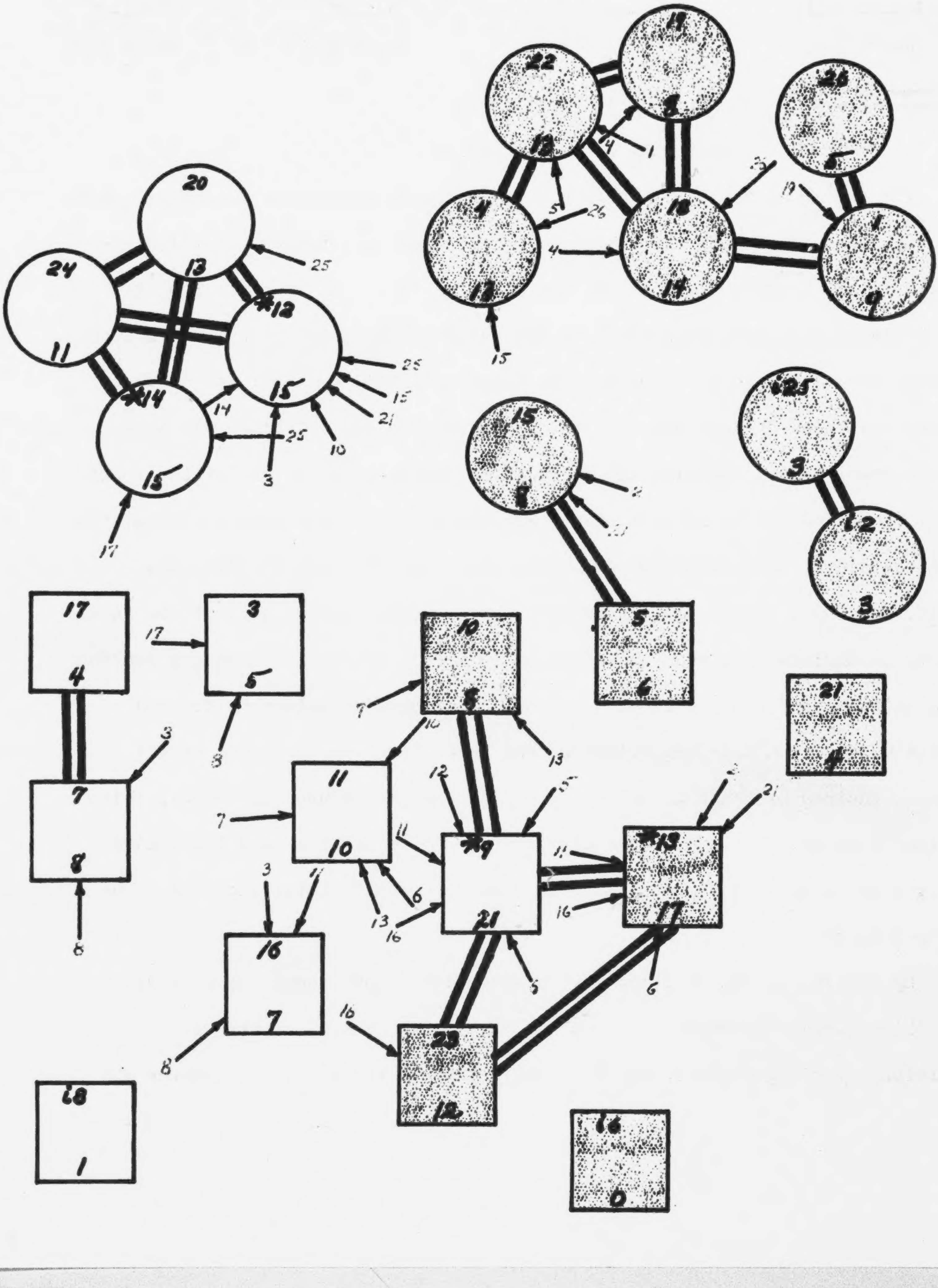
═ indicates a mutual choice

→ indicates a one-way choice

The number at the top of each circle or square designates the child, while the number at the bottom refers to the total number of choices the child received in all three criteria. The most popular children, or stars (*), and the isolates (i), were determined on the basis of the total number of choices in all three situations. According to Gronlund (1959) critical raw status scores for three choices allotted to each person on one criterion are zero, at the lower limit, implying the child is an isolate, and seven, at the upper limit, implying the child is a star. For three choices on three criteria, the critical scores were three, at the lower limit, and fifteen at the upper limit. Although the popularity extremes were judged on the basis of the total number of choices received, the diagrams were made on the basis of the seating companion criterion which results in some discrepancies between stars and isolates judged on this one criterion and those based on the total of all three. Choices of seating companions were diagrammed since, in theory, this criterion seems to combine the social aspects of "play with" and the academic aspects of "work with." Actually, the results for each situation tend to be quite similar.

By looking at Figure 1, one may observe in AI that there are four stars: two white girls, one white boy, and one Negro boy. There are also four isolates: two Negro girls, one Negro boy, and one white boy. IQ scores did

Figure 1. AI
Diagram of seating companion choices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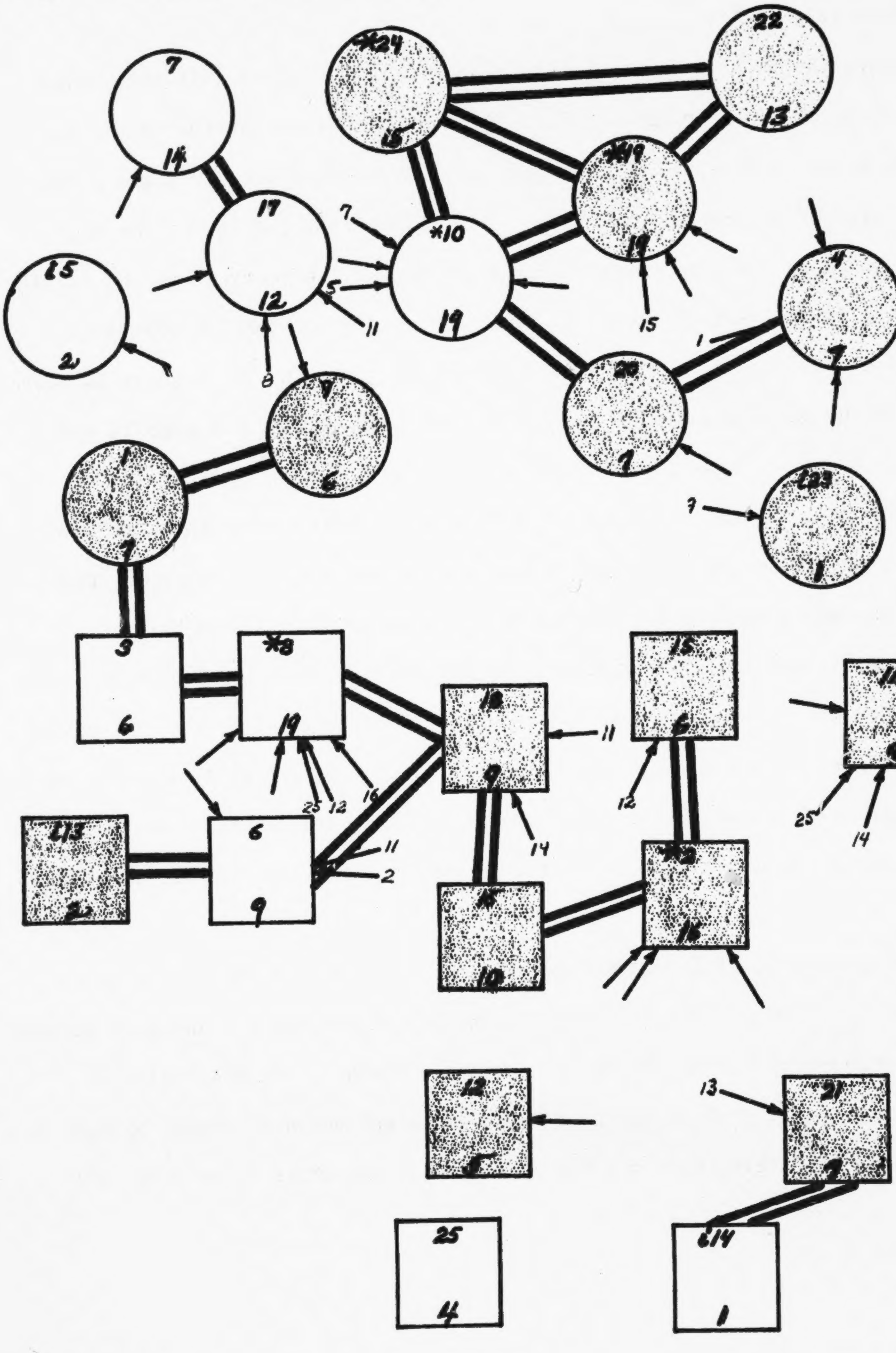
not tend to differentiate between the extremes of social popularity, although it is of interest to note that none of the stars of this class scored above 120, while one of the isolates did.

Perhaps the most obvious point to be gleaned from Figure 1 is the closely-knit in-group of the four white girls. None of them chose outside of her own race. Parallel to this is the fact that none of the more popular Negro girls chose outside of her racial group, while the three least popular of the Negro girls chose among the apparently closed white group. In contrast to the racial in-grouping on the part of the girls, there appears to be considerably more interracial choosing among the popular boys. The girl with the highest IQ score was one of the most frequently chosen among the Negro girls, but high IQ and popularity appear to have little correlation among the other groups.

Figure 2 shows that there are five children of star status in A II: one Negro boy, one white boy, two Negro girls and one white girl. There are four children who would be regarded as isolates: one Negro boy, one white boy, one Negro girl, and one white girl. It appears, in this case that neither stars nor isolates are found predominantly among a particular race or sex. IQ scores were, again, not good predictors of popularity; however, one girl, who has one of the highest IQ scores in the four classes studied, did receive considerably more choices on the criterion of working companion than either of the other two criteria.

The figure of AII shows a similar setting, as in AI, of four white girls and several Negro girls, but a much different social situation. The most popular Negro and white girls have made mutual choices. Further, the white girl is popular among a fairly close group of Negro girls and was also chosen by the other three white girls, whom she did not choose. The other three girls made

Figure 2. AII
Diagram of seating companion choices.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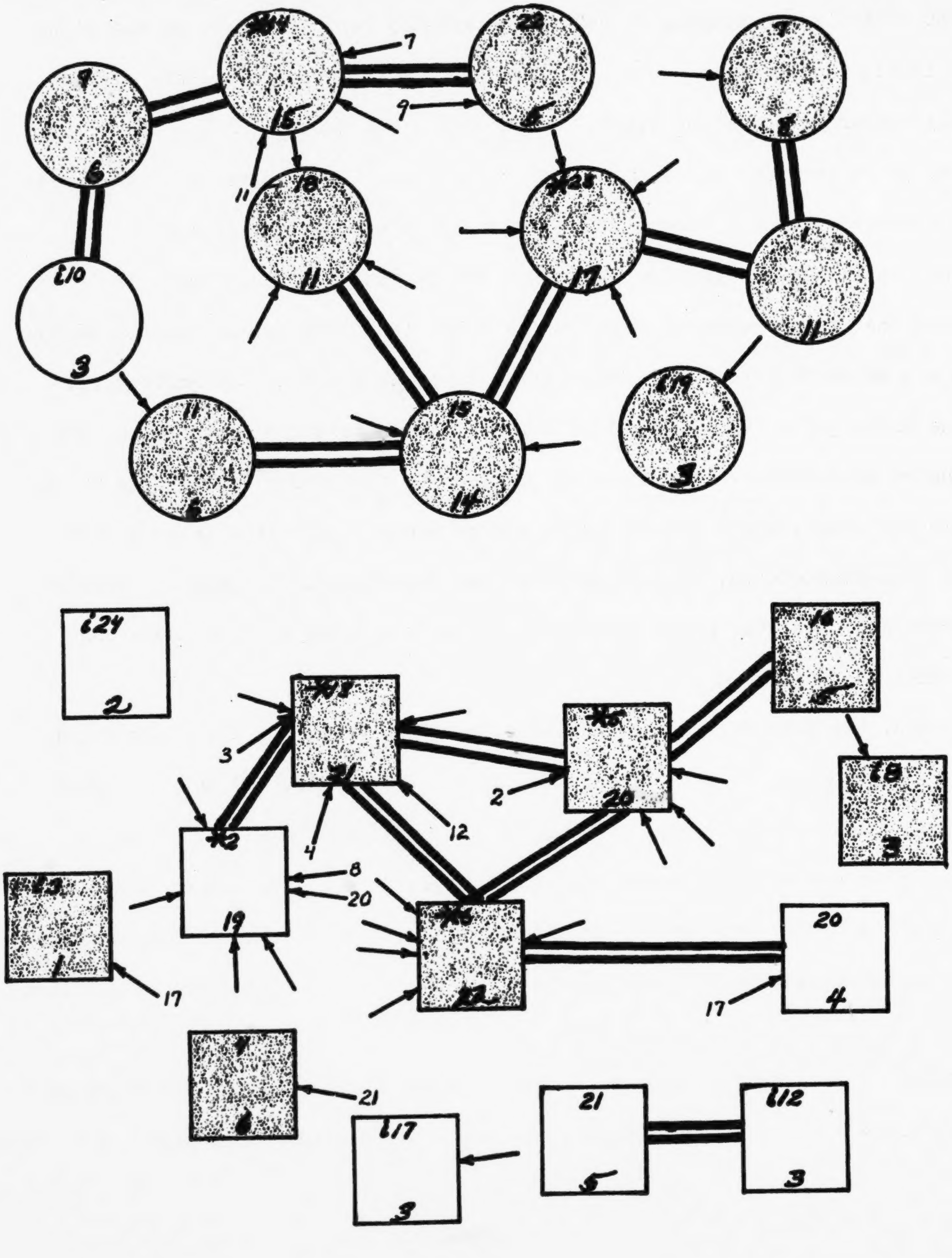
only one choice outside of their own race-sex group. The boys, again, have displayed more cross-race choosing, especially of mutual choices, than the girls. There is one white boy-Negro girl mutual choice which is most unusual, especially in view of the rigid boundaries usually separating boys and girls at the fifth grade level. It is an interesting point that the three stars on this single seating companion criterion all have IQ scores above 120.

BI has a very low percentage of white children (29%) compared to the other three classes studied. Figure 3 shows that there are six children with star status: three Negro boys, one white boy, and two Negro girls. Thus, it is observed that the popularity stars of the class tend to be predominantly Negro. There are seven isolates: two Negro boys, three white boys, one Negro girl, and one white girl. Thus, over half of the white population of the class are designated as isolates. It should be pointed out that there is only one white girl in the class, which causes one to wonder whether this is a large factor of her isolation status, even though she does have one mutual choice. Neither the members of the star group nor the isolates tend to be congregated in one particular IQ range group.

Again, the most striking observation from the diagram is the intertwined group of Negro girls focusing their choices on a few girls, and only one girl choosing outside of the group. Of course, with only one white girl, the opportunities are rather limited unless a boy would be chosen. There appears to be quite a bit of cross-race choosing on the part of the white boys, while most of the choosing outside of their own race for the Negro boys focused on one white boy.

Figure 4 reveals four classroom stars: three Negro boys and one Negro girl. It thus appears that the Negro population has a sizable edge on popularity in this

Figure 3. BI
Diagram of seating companion choices.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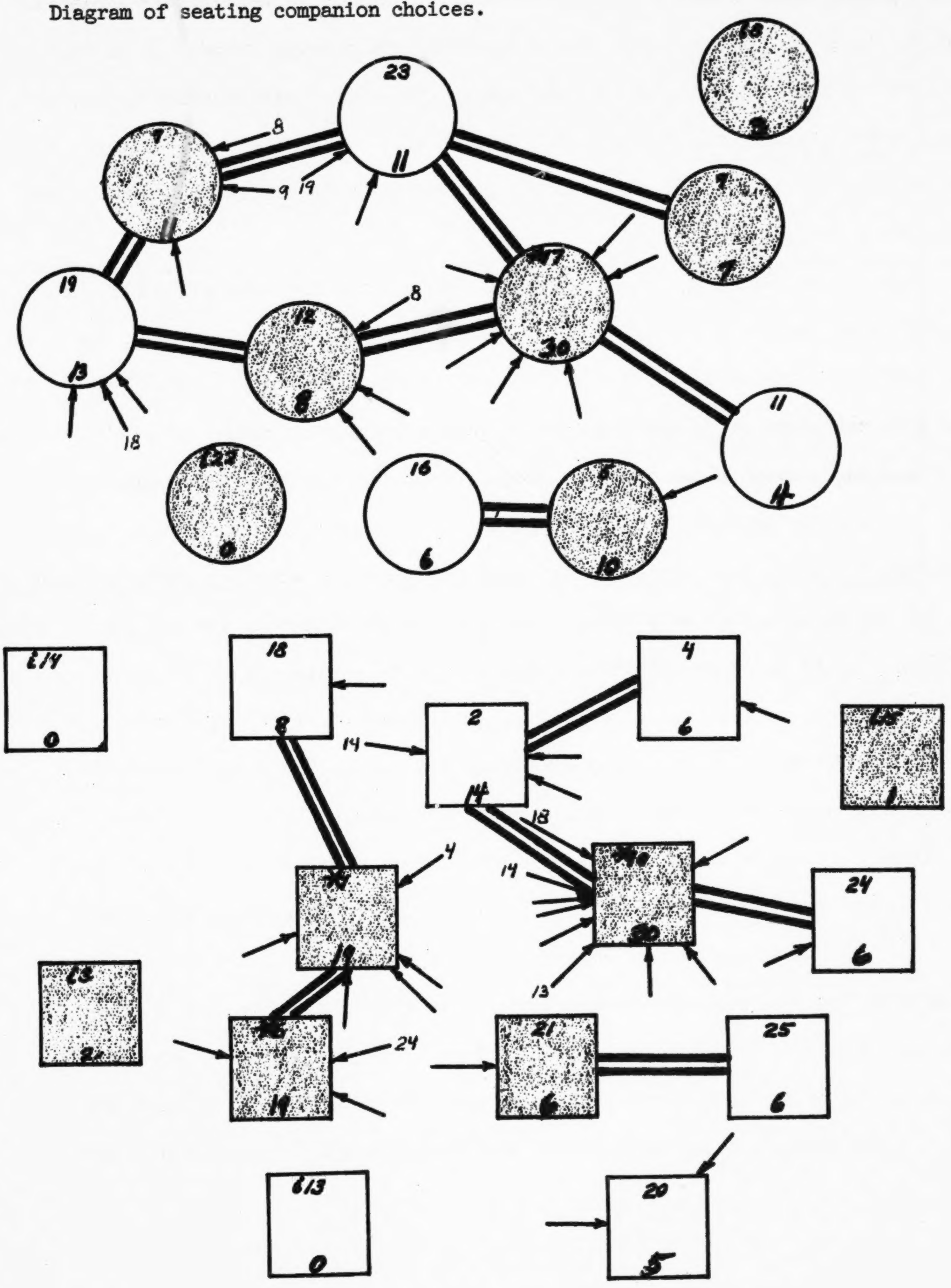
5
ℓ12
3

Figure 4. BII
Diagram of seating companion choices.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classroom. There were six isolates: two Negro boys, two white boys, and two Negro girls. This suggests that Negro children tend to be more likely isolates. The IQ scores of the stars were all well within the average range. It is of interest to note that this class experiences the unusual circumstance of having eight white youngsters with intelligence quotients of 120 and over assembled in one room, yet none of them blossomed in popularity among whites or Negroes. Two were among the isolates.

Looking at Figure 4, it is interesting to observe the several interracial choices made among the girls, in spite of the fact that there is, again, the familiar situation of four white girls among several Negro girls. Among both the boys and girls it is not possible to find any group of mutual choices of only one race, even though the most frequently chosen children were Negro.

If expected patterns of racial prejudice were maintained, one might expect children to choose children of a different race more for working companions than in the social situation of playing. Table 1 reveals that this was not the pattern. In AI the Negro children consistently chose other Negro children over seventy percent of the time. The highest percentage of white children chosen was in the situation of selecting a seating companion. The lowest cross-race choice percentage was in choosing a working companion. The white children, too, consistently chose other white children over seventy percent of the time, the lowest cross-race choosing occurring in the selection of seating companions.

For AII the percentage of Negroes choosing Negroes is higher in all situations than for choosing white companions, although, only in the choice of playing companions was it ever seventy percent. The percentage of Negroes choosing whites was over forty percent on the criterion of working companion. These discrepancies in percentages are what would normally be expected---more

Table 1. Percentages of Negro and White children choosing within and outside of their own racial group in each of three situations.

Class		% choosing Negroes in each situation			% choosing whites in each situation		
		to sit with	to work with	to play with	to sit with	to work with	to play with
AI	Negroes	71	76	71	29	22	27
	Whites	18	27	27	82	73	73
AII	Negroes	67	58	73	33	42	27
	Whites	52	48	63	48	52	37
BI	Negroes	88	90	90	12	10	10
	Whites	67	48	62	33	38	38
BII	Negroes	56	54	59	44	46	41
	Whites	69	72	75	31	28	25

cross-race choosing in working situations, and fewer in the more social setting of play. The white children in the class upset the theory by choosing Negroes over sixty percent of the time for playing companions and only forty-eight, the lowest of the three, for working companions.

In Table I, class BI illustrates a case in which the Negro children represent the status group in popularity. The percentage of negro children choosing other Negroes is nearly 90% in all situations, while the white children chose a higher percent of negro companions than white. A different phenomena is revealed in class BII. Negroes chosen by Negroes are just over 50% and white companions chosen by negroes are just under 50%. The percentage of Negro companions chosen by white children is near seventy in all situations---higher than the negro choices. In this class, too, the highest percentage of cross-race choices for the white children was in the social situation of "to play with," while conversely, this was the lowest percentage of cross-race choosing for the Negro children.

Table 2. Chi square results on the significance of race in choosing companions in four different classrooms, for the situation of "to sit with."

Class	Negro choices		White choices	
	of Negroes	of Whites	of Negroes	of Whites
AI	3.28			**17.87
AII	.09		1.43	
BI	**7.75		.23	
BII	.41		*4.02	

* $p < .05$
** $p < .01$

Table 2 indicates that race definitely played a significant role in the choice of companions in some classes. Chi squares were calculated to determine whether there were differences from the expected choices for each racial group. Since the racial ratio was different in each class a different expectancy had to be calculated for each situation. For class AI, both Negroes and whites chose companions from their own racial group to a degree significantly beyond chance expectations for the whites and close to statistical significance at the five percent level for the Negroes. Neither the Negro nor white children in class AII chose companions on the basis of race to a degree significantly beyond chance expectancy.

Table 2 indicates further Negroes chose other Negroes very significantly beyond chance expectations in class BI. The white children's choice of Negro companions was not significant beyond that which might be expected by chance. In class BII, race, apparently, did not make a significant difference in the choices made by Negro children, but it did in the choices of the white children. White children chose Negro companions significantly beyond that which one would expect by chance---and most significantly in the more social situation of play. This is definitely not what one would expect at first thought from a group of culturally disadvantaged white children in a small mid-western city.

Table 3. Chi square results on the significance of sex in choosing companions in four different classrooms.

	Boys' choices		Girls' choices	
	of boys	of girls	of boys	of girls
AI	**16.00			**27.9
AII	**28.52			**26.27
BI	**33.43			**39.60
BII	**26.30			**42.10

** X^2 is significant at the five % level of significance.

Table 3 reports the Chi square analysis of social choice by sex. Expectancy figures were calculated similar to the method used for the racial factor. It confirms, at very high confidence levels, that girls choose girls and boys choose boys significantly beyond chance expectations regardless of specific situations or classroom. This outcome is in thorough agreement with numerous studies finding a cleavage between the sexes in sociometric choosing patterns among elementary, intermediate aged boys and girls.

Table 4 shows the choice of seating companions by IQ level. Since these classes were organized for high aptitude students in these culturally disadvantaged areas there ia a definite lack of low ability students in this comparison and this may have influenced the results. Nevertheless, it can be noted in the Table that in none of the classrooms did IQ significantly influence social choice. for either the Negro or white students. Other factors of race and sex seemed

Table 4. Significance of intelligence (measured by Binet IQ scores) in choosing seating companions in each of four classrooms.

Class	IQ Score Range Group	Negro Children Chosen			
		N	Choices Re-ceived	Mean	X^2
AI	120 +	2	6	3.00	.57
	110 - 119	5	12	2.40	
	100 - 109	6	15	2.50	
	below 100	2	6	3.00	
AII	120 +	3	10	3.00	2.70
	110 - 119	1	3	3.00	
	100 - 109	7	24	3.43	
	below 100	5	9	1.80	
BI	120 -	4	13	3.25	2.82
	110 - 119	6	27	4.50	
	100 - 109	7	19	2.71	
	below 100	---	------	------	
BII	120 -	---	------	------	3.30
	110 - 119	5	24	4.80	
	100 - 109	6	18	3.00	
	below 100	2	5	2.50	

Class	IQ Score Range Group	White Children Chosen			
		N	Choices Re-ceived	Mean	X^2
AI	120 -	4	11	2.75	2.17
	110 - 119	5	22	4.40	
	100 - 109	2	6	3.00	
	below 100	---	------	------	
AII	120 -	4	18	4.50	3.48
	110 - 119	5	11	2.20	
	100 - 109	---	------	------	
	below 100	---	------	------	
BI	120 -	2	2	1.00	5.20
	110 - 119	3	9	3.00	
	100 - 109	2	2	1.00	
	below 100	---	------	------	
BII	120 -	8	18	2.25	0.16
	110 - 119	4	10	2.50	
	100 - 109	---	------	-----	
	below 100	---	------	-----	

more important in this setting. These results are contrary to others found in the literature that have suggested a strong relationship between IQ and social desirability.

Conclusions and Implications

The first question as to whether choices of seating, working and playing companions would be made on the basis of the child's own racial group, was supported in general by class AI and partially by class BI. It was not supported by class AII, and was partially reversed by the findings in class BII. The answer to the questions, "Are there cross-race social and working groups?" or, "Will the children choose their companions from their own race?" is---it depends. It would be nice to know, on what???? Some clues might be salvaged from the information at hand by looking at the two groups which ostensibly had the most complete interracial choosing patterns, classes AII and BII. Both groups included older children, sixth graders. Class AII had the only Negro teacher of the four classrooms studied. Class BII had the closest split of Negroes and whites (13/12) of any of the four classes. Perhaps another important factor was that the better achieving 5th graders were placed in the number II classes with the sixth graders, while the rest of the 5th graders were placed in the number I classes with the fourth grade. These, however, are only the most obviously different factors available from the information here. There are undoubtedly numerous other influencing variables of environment and teaching techniques which might warrant further investigation. It would be interesting to know, too, if the girls tend to congregate in groups of their own race significantly more than do boys.

The third question as to whether those children with the higher intelligence scores will tend to receive the most choices within each classroom, while those children with the lowest intelligence scores will tend to receive the fewest choices, was not supported in any of the four classrooms studied, by either white or Negro groups. Thus, it could be said that, contrary to expectations, the more intellectually gifted children were not chosen any more frequently than children of average ability. It would be interesting to know if these findings result from (1) a fact that intellectual ability is not an important trait for admiration (or emulation) in companions of culturally disadvantaged children; (2) the fact that perceived intelligence is very likely not the same as Stanford-Binet intelligence quotients; or (3) the fact that these are just gifted children who are merely behaving like gifted children, and supporting the suggested findings of Gallagher (May, 1958) that, "...the gifted child is not concerned or unduly influenced in his choice of friends by their intellectual ability..." (p. 469) All of these children know they are in a special class for bright children, and they may assume that anyone who is in the class has to be fairly intelligent. Thus, in a fairly homogeneous classroom (such as each of these is), intelligence is possibly not as important as it might be in a heterogeneous classroom.

The isolates within the classes did not tend to come from any particular race, sex, or intellectual ability group. The stars were not chosen from a particular range of intelligence scores. There were, however, twice as many Negro stars as white stars (12/6) while the total ratio of Negroes to whites was 61/39. In general, it would be interesting to know the attitudes of these children toward intellectual ability and whether or not many of these children are seeking peer acceptance at the expense of hiding this ability which they need to develop.

There was no major factor determined in this study regarding the basis upon which stars were chosen and isolates not chosen. From discussion with the teachers, it was learned that many of the isolates tended to have two major characteristics: (1) they were from the more deprived homes, and (2) they tended to be quiet and withdrawn, although a few were the aggressive type. Most of them seem to have "tuned out" everyone---mother, teacher, children. This might imply the necessity of spotting these children and giving them some special assistance as part of the special program for these culturally deprived children, otherwise, such a program is not going to do much for a child who "isn't there."

In discussing generalizations about the results of this study, one should bear in mind that the classes studied were of culturally deprived gifted children, not an advantaged class of gifted children. Whatever might be said regarding the children here need not necessarily apply to other classes of gifted children. One of the major implications of this study is that well integrated classrooms of culturally disadvantaged children can take place. Also, in all classes there was at least one popular child who formed a "bridge" between the two races---and through whom the teacher could encourage the children to work with each other.

From observing the data in all four classes, it can be said that sex was the most important single factor in chosing companions. Race is the next most important factor, and intelligence is of the least significance.

Future questions resulting from this study:

1. What is different about the teacher who fosters a well-integrated class-room? What is different about the entire classroom?
2. Do girls tend to congregate in groups of their own race significantly more than do boys?
3. Do the isolates tend to come from the most deprived homes?
4. Is intelligence an important variable in heterogeneous classrooms of culturally disadvantaged children?
5. To what extent do the children merely reflect their teacher's opinions in regard to social choices?

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HONORS PROGRAM STUDENTS:
Their Academic Attainments, Personality Traits and Self Concepts

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There has been a great growth in college programs for academically talented students since 1958. Despite the fact that these programs have emerged individually, with no major effort towards central planning, the broad purposes given for these programs would be accepted by most of the individual programs.

Talent and Tomorrow's Teachers (1963) characterize such programs in this statement:

> It is recognized that Honors programs in general are distinguished by the breadth, depth, and sense of inquiry which are considered important elements in working successfully with students whose intellectual and creative talents transcend the average.

Yet the translation of these broad admirable goals into a concrete day-by-day program is a demanding challenge. Can programs such as this institutionalize freedom of inquiry or can such organizational planning foster student creativity? Stiles (1963) cautioned against viewing such a program as an administrative entity as follows: "We ought to think of honors programs more as a way of life in scholarship for students rather than as a particular mode of administrative organization. Through the honors appraoch, we must create conditions that make possible this way of life. This takes the focus off any particular kind of methodology and places it in a goal."

In these new attempts to provide a more effective learning environment for the superior college student, there have been few trails to follow. Accordingly, most of these programs have expended their total energy and resources upon the necessary task of breathing life into the bare structure of general objectives and purposes. Nevertheless, the need for evaluation to provide proper direction for a dynamic program and to correct the inevitable false starts is well recognized. Cohen (1963) has commented "Honors must remain

> vigilant against organizational 'busyness', against mere reiteration of claims of excellence accompanied

> by meager or narrowly elitist programs. Claims of achievement must be subjected to rigorous analysis to forestall mere affectation and mannerisms of excellence."

The purpose of the present exploratory study is to compare students who have been Inactive in a university's Honors program either through voluntary withdrawal or failure to maintain grade point average with Active honors students who continue in the program. In choosing this issue, the investigator felt the students withdrawing from the program provide a pivotal point for program improvement in attempting to discover why certain students could not accommodate to the program or why the program found itself unable to assimilate a certain group of students.

The James Scholar Program

The James Scholar program at the University of Illinois began in the fall of 1959 with some one hundred and ninety one students. By September 1965, approximately two thousand students will be included in the program. James Scholars are invited to participate in this all-University program because of their outstanding skills and academic promise. High School students in their senior year are eligible to apply or to be nominated by their schools for designation as a James Scholar. Selection factors for such nomination include high school grades, performance on aptitude and achievement tests, and the recommendation of high school teachers in major fields of interest.

No monetary award is included in the appointment as a James Scholar, but this assignment does permit the student to enroll in honors courses, provides him with a special faculty honors advisor, presents continuing information about awards and scholarships and has the use of special study rooms and lounges in the James Center. James Scholars may withdraw from the program whenever they wish and must leave the program when their academic performance drops below a 4.0 (B) average.

PROCEDURE

Subjects

For a select group of superior students who have been identified by elaborate screening measures the attrition rate in the James Scholars Program appears quite high. Since the Program's inception in 1959, the percentage of James Scholars in good standing at the end of their freshman year has ranged from 51% to 64% with the average at 59% for the six-year period.[1]

The present sample was based on a total of 196 James Scholars in their junior year at the University of Illinois, Urbana, in 1964-65. Self-concept questionnaires were mailed to this group and 130 (66%) usable measures were returned. Table 1 shows the distribution of these students and their academic status in the active and inactive groupings.

TABLE 1

Population Characteristics

	Men		Women		
	Actives (N = 47)	Inactives (N = 32)	Actives (N = 28)	Inactives (N = 23)	Totals N = 130
Mean HS Rank Percentile	93.5	94.0	96.8	92.3	94.2avg
ACT Percentile Equivalent	89	89	89	89	89
College Grade Point Mean (5.0 = A)	4.37	3.76	4.49	3.67	4.07avg

The high school rank and ACT scores indicate little to choose between the Actives and Inactives but a clear distinguishing feature was the grade point average earned at the University of Illinois. The students who became inactive had made a less effective academic record, as might be expected.

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[1] Table IV.3., Annual Report 1964-65, University Honors Programs, University of Illinois.

Measuring Instruments

The focus of the present investigation was on the general area of personality and the specific dimensions of self-concept. It was felt that it would be in this area that clues could be found to the ineffective performance of the Inactive students who came to the University with such apparently high academic aptitude.

The self-concept is an especially difficult dimension of personality theory to work with due to its nebulous status and problems of definition. Raimy (1943) suggests that,

> The self-concept is the more or less organized perceptual object resulting from present and past self-observation....it is what a person believes about himself. The self-concept is the map which each person consults in order to understand himself, especially during moments of crisis or choice.

How this map may be best delineated is not known, although instruments that purportedly measure aspects of self-concept exist in great profusion. Strong and Feder (1961) commented that the instruments used to date for measuring the self-concept left much to be desired in many respects, especially in the area of validity, but that there was a promising trend to approach personality adjustment in terms of a totality of response.

There are a variety of limitations that exist in varying degrees for all self-report inventories that should be recognized:

> One arises from varying interpretations of a question that may seem straight-forward but contains some ambiguity, or from varying interpretations of the answer options. Another is the tendency of the person to respond as he thinks he feels, or as he thinks he defines his values. Another is a tendency to fake, or to distort responses in an attempt to bias the impression given to the examiner. (Educational Testing Service, 1965)

The Self-Concept Inventory used in the present study was developed by Pauline Sears (1963) as a questionnaire consisting of 100 items and covering ten areas as follows:

Physical ability
Mental ability
Social relations same sex
Social relations opposite sex
Attractive appearance
Social relations with teacher
Work habits
Social virtues
Happy qualities

Each one of the questions is answered in three ways:

(1) Am I satisfied with myself in this area?
(2) Do I think I will make some improvement in this area?
(3) Compared with my peers, how would I rate myself in this area? (very good, better than a good many, better than average, fair, not very good).

The Inventory was adapted for use with a college population by having five doctoral students in special education at the University of Illinois edit the language of the items to approach the college level in their structure. Content was not changed in any other respect.

Additional Measures

In addition to the Sears self-concept scale administered to the students at the present time, a number of other instruments are included in the present study. All entering freshmen James Scholars had taken a battery of tests that included intellectual, creativity and personality measures and these were included in the comparison as follows:

The American College Testing Battery. This yielded English, math, social studies, natural science and composite achievement scores.

National Merit Battery. The same content area scores were used as those of the ACT.

Terman Concept Mastery Test. This is a group intelligence test designed to measure ability to deal with ideas or concepts through verbal problems with synonyms-antonyms and the completion of analogies.

Christensen-Guilford Battery. These tests of divergent thinking abilities are presumably related to creative thinking. The areas measured were:

a. Word fluency -- the ability to produce rapidly a list of words each of which satisfied the specified requirement that it contain a certain letter.

b. Associational fluency -- the ability to produce rapidly words that bear some specified, meaningful relation to a given word.

c. Ideational fluency -- the ability to evoke a large number of ideas in situations that present meaningful requirements.

d. Expressional fluence -- the ability to produce rapidly words in connected discourse.

e. Consequences -- this is representative of the quality of producing remotely associated responses which is one of the elements in a definition of originality.

The Myers-Briggs Type Indicator. This is a self-report inventory which is intended to measure variables stemming from the Jungian personality typology. It consists of four scales: Extraversion-Introversion, Sensation-Intuition, Thinking-Feeling, and Judging-Perceiving. The E-I scale is presumed to measure interest in things and people or concepts and ideas; the S-N scale, tendencies to perceive through the usual sensory processes or indirectly, via the unconscious; the T-F scale, tendencies to judge (or evaluate) phenomena rationally and impersonally or subjectively and personally; and, the J-P scale, tendencies to reach conclusions about phenomena or to become aware of them.

The Minnesota Multiphasic Personality Inventory. The complete form of the MMPI had been given to this group. T scores were reported for all traditional areas and, in addition, the Social I.E. and the Ego Strength scales were scores.

Method

Except for the self-concept inventory, all measures had been completed by this group of James Scholars when they were entering freshmen at the University of Illinois in the fall of 1962. Nothing is known about conditions at the time these tests were administered. The original score sheets of the MMPI were rescored for the Ego Strength scale and converted to T scores as had been done with the other scales.

The self-concept questionnaire was mailed to this special group in February, 1965, with instructions for completing the inventory and for its return. Prior to the mailing of the questionnaire an introductory letter was sent out to this group of James Scholars by the Acting Director of the Program, advising them of the study and urging their cooperation. The questionnaires were scored and the results keypunched on to IBM cards. No personal contacts were made at any time with these students. The self-concept scores remained confidential and were not given to the James Scholars office as part of the agreement in obtaining student cooperation and participation.

Analysis

All of the data were placed on IBM cards. Decks of data were programmed via SSUPAC for treatment by the 7094 digital computer at the University of Illinois. The following programs were run:

1. Tests of significance -- all variables of the seven measures.
2. Means, standard deviations, and correlations -- all variables.
3. Sum scores for all 30 variables for the self-concept measure.

RESULTS

Self-Concept

Table 2 shows the comparison of the Inactive and Active students on the Sears measure of self satisfaction. Only one of the ten scales shows a t test difference in favor of the Actives' higher self perception of their own mental ability. It is interesting that the three lowest average scales of the Inactive men were school subjects, work habits and mental ability.

Table 2. The Comparison of Active and Inactive James Scholars on a Measure of Self Satisfaction.

SELF CONCEPT	MEN				WOMEN			
	ACTIVES N - 47		INACTIVES N = 32		ACTIVES N = 28		INACTIVES N = 23	
	Mean	σ	Mean	σ	Mean	σ	Mean	σ
Physical ability	5.65	3.61	6.24	3.75	3.79	3.73	5.78*	3.36
Mental ability	6.84*	2.44	5.62	2.72	6.25	2.07	5.17	2.98
Social relations same sex	7.39	2.52	7.76	2.22	7.61	2.33	6.22	3.52
Social relations opposite sex	6.10	2.94	6.15	3.39	7.36	2.61	6.70	3.01
Attractive appearance	7.10	2.47	7.09	2.68	7.07	2.32	6.43	1.95
Social relations teacher	7.94	2.14	7.26	2.70	8.21**	1.91	6.13	2.65
Work habits	5.78	2.77	5.06	2.76	6.57*	2.57	5.00	3.09
Social virtues	7.37	2.27	7.68	2.70	6.71	2.49	6.26	3.03
Happy qualities	6.04	2.76	6.26	2.86	5.96	1.95	4.78	2.71
School subjects	5.37	2.51	4.56	2.39	4.86	2.49	4.61	2.78

*P < .05

**P < .01

The comparison between the Inactive and Active women revealed three t test differences. There was significant difference found on physical ability with Inactive women having a higher self image of their physical ability. There was also a significant difference favoring the Active women on social relations with teachers. The work habits variable recorded significant differences between the women's groups, with the Active group more positive as might be expected.

The self-concept measure failed to provide a consistent pattern of traits that would distinguish one group from another. The Active men were very similar in their expressed concepts of themselves to the Inactive men, and the same similarity existed between the Active women and Inactive women. More differences existed between the men and women where the men had an overall better concept of themselves than did the women.

There seemed to be little discriminating power in this particular measure of the self-concept for where there was a general pattern of satisfaction in one area it pervaded the other areas as well. This may represent the true feeling of the individual for a positive feeling of self-actualization and self-fulfillment will influence all aspects of a person's life resulting in a holistic concept of self that is good and strong. In the case of the women we can observe a higher average self perception for the Actives over the Inactives in nine of the ten scales. Such differences as now exist may also be the result of their experience at Illinois rather than a cause.

Academic Measures

The ACT, National Merit, and the Terman Concept Mastery Test batteries were analyzed next in Table 3. The same test areas for the ACT and National Merit were analyzed with consistent results. Only one significant difference was found with the Active women scoring higher on ACT Social Studies. The scoring patterns were very close across the four groups. There was a slight trend for the Actives to achieve higher scores than the Inactives. The University of Illinois norms for the ACT in 1962-63 showed percentile equivalents of 89 for the average of each of the groups (see Table 1). On the basis of prior academic attainment as measured by these two batteries we found few differences existing between the groups of James Scholars.

Table 3. The Comparison of Active and Inactive James Scholars on Measures of Intellectual Ability.

	MEN				WOMEN			
	ACTIVES N = 47		INACTIVES N = 32		ACTIVES N = 28		INACTIVES N = 28	
	Mean	σ	Mean	σ	Mean	σ	Mean	σ
1. ACT English	26.24	2.14	25.94	2.27	28.14	2.88	27.32	2.49
2. ACT Math	31.92	2.46	32.06	3.32	29.46	4.27	29.72	4.33
3. ACT Social Studies	28.73	3.39	28.03	3.13	29.57*	2.28	27.92	3.16
4. ACT Natural Science	29.92	2.74	29.18	2.45	29.36	3.23	28.96	2.55
5. ACT Composite Score	29.39	1.89	28.94	1.84	29.25	2.44	28.60	2.38
6. N. Merit English	24.80	3.05	24.23	2.52	27.14	1.99	27.50	1.64
7. N. Merit Math	30.88	2.96	30.08	2.36	30.00	2.72	29.60	1.90
8. N. Merit Social Studies	28.42	1.60	27.54	1.85	28.43	1.32	27.70	1.64
9. N. Merit Natural Science	28.11	1.97	27.61	1.80	28.21	1.97	27.60	2.17
10. N. Merit Composite Score	28.08	1.29	27.61	.77	28.36	1.15	28.20	1.14
TERMAN CONCEPT MASTERY TEST								
1. Part I Synomyms-Antonyms	43.23*	19.02	33.81	11.65	44.47	17.02	44.87	20.72
2. Part II Analogies	35.17	12.16	30.47	9.76	34.07	12.74	31.17	13.81
3. Total Score	78.40*	28.30	64.28	17.68	78.64	28.24	76.04	32.60

*$p < .05$

The Terman Concept Mastery Test has three scores: Synonyms-Antonyms, Analogies, and a Total score. The Inactive men were much lower in their scores than the other three groups and these differences were significant on Synonyms-Antonyms and Total score. Since the ability to deal in abstractions is purported to be a characteristic of the intellectually talented we may have, in this measure, a more effective means of effectively identifying male students who would face academic difficulty, than is being done by achievement tests and high school rank.

Creativity Tests

The Christensen-Guilford Creativity Battery yielded meager results in comparison of the Active and Inactive men. None of the differences approached significance and suggested that on the dimension of divergent thinking measured by this test these groups did not differ.

Table 4. The Comparison of Active and Inactive James Scholars on Measures of Creativity

	MEN				WOMEN			
	ACTIVES N = 47		INACTIVES N = 32		ACTIVES N = 28		INACTIVES N = 23	
	Mean	σ	Mean	σ	Mean	σ	Mean	σ
1. Word Fluency	51.53	12.40	50.97	8.87	53.64*	10.76	48.35	6.48
2. Associational Fluency	19.06	5.65	18.25	5.12	20.36	5.60	18.87	5.29
3. Ideational Fluency	68.26	18.39	65.78	13.85	76.57**	18.13	63.43	12.21
4. Expressional Fluency	12.40	4.17	12.31	3.52	12.86	4.71	11.22	3.73
5. Consequences	73.36	20.14	71.34	20.78	77.11**	21.04	61.91	15.61

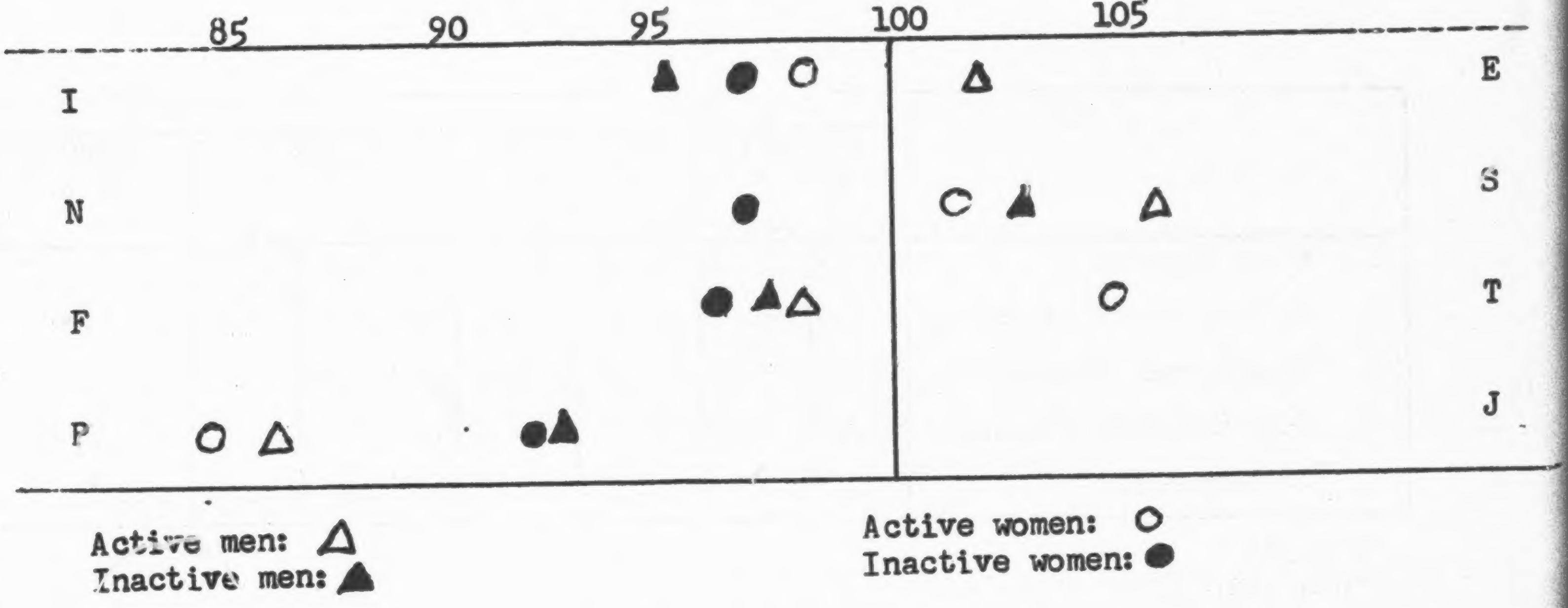
*$p < .05$
**$p < .01$

The comparison of Active and Inactive women resulted in quite different results. The Active women were significantly superior on Word Fluency, Ideational Fluency and Consequences. In fact, the Active women were more successful with this battery than the other groups, primarily because of their higher scores on Ideational Fluency and Consequences. This would ascribe to the Active women the qualities of being more productive in ideas and of showing more originality, a prime factor in creativeness. The Inactive women were lowest in attainment on this battery, primarily because of their low scores on the Consequences test. Just as Inactive men might be identified by their low performance on the Synonyms-Antonyms test the Inactive women might be identified by low performance on the Creativity test battery.

Personality Inventories

Figure 1 gives a graphic portrait of the four group performances on the Myers Briggs Type Indicator, in addition to the mean scores. While significant differences were not obtained on any of the individual scales a different average typology was found with the groups.

Figure 1. Myers-Briggs Type Indicator Profiles of Active and Inactive James Scholars.



		MEN				WOMEN			
		ACTIVES N = 47		INACTIVES N = 32		ACTIVES N = 28		INACTIVES N = 23	
		Mean	σ	Mean	σ	Mean	σ	Mean	σ
1. Introversion-Extraversion Score	IE	102.0	18.15	95.27	21.48	97.71	13.39	96.78	25.94
2. Intuition-Sensing Score	NS	105.96	15.48	103.42	13.12	101.43	23.44	96.78	25.24
3. Feeling-Thinking Score	FT	98.13	11.39	99.76	12.58	104.96	12.05	96.39	24.33
4. Perception-Judging Score	PJ	86.47	26.88	92.85	14.45	84.82	19.99	91.78	24.48

As we can see on Figure 1, the Active men showed a preference type of ESFP. This indicates ease with environment, observation, realism, enjoyment, reliance on experience, sociability, few analytical powers and adaptability.

The Inactive men's preference type was ISFP, which shows depth and concentration in place of ease with environment. A simpler explanation of the difference might be that the Inactive men tended to be introvert types that are more reserved and keep to themselves more.

The Active women's average preference type was ISTP which shows depth and concentration, realism and observation, capacity for analysis and logic, and adaptability.

The Inactive women's type was INFP which relates to depth and concentration, insight, ingenuity, grasp of the complicated, capacity for devotion and sympathy and adaptability.

One finding of interest was the correlation ($r > .50$) of the Perception-Judging scale with the ACT, the Terman Concept Mastery, and the Guilford Ideational Fluency test by the two women's groups. The Myers-Briggs Manual states that:

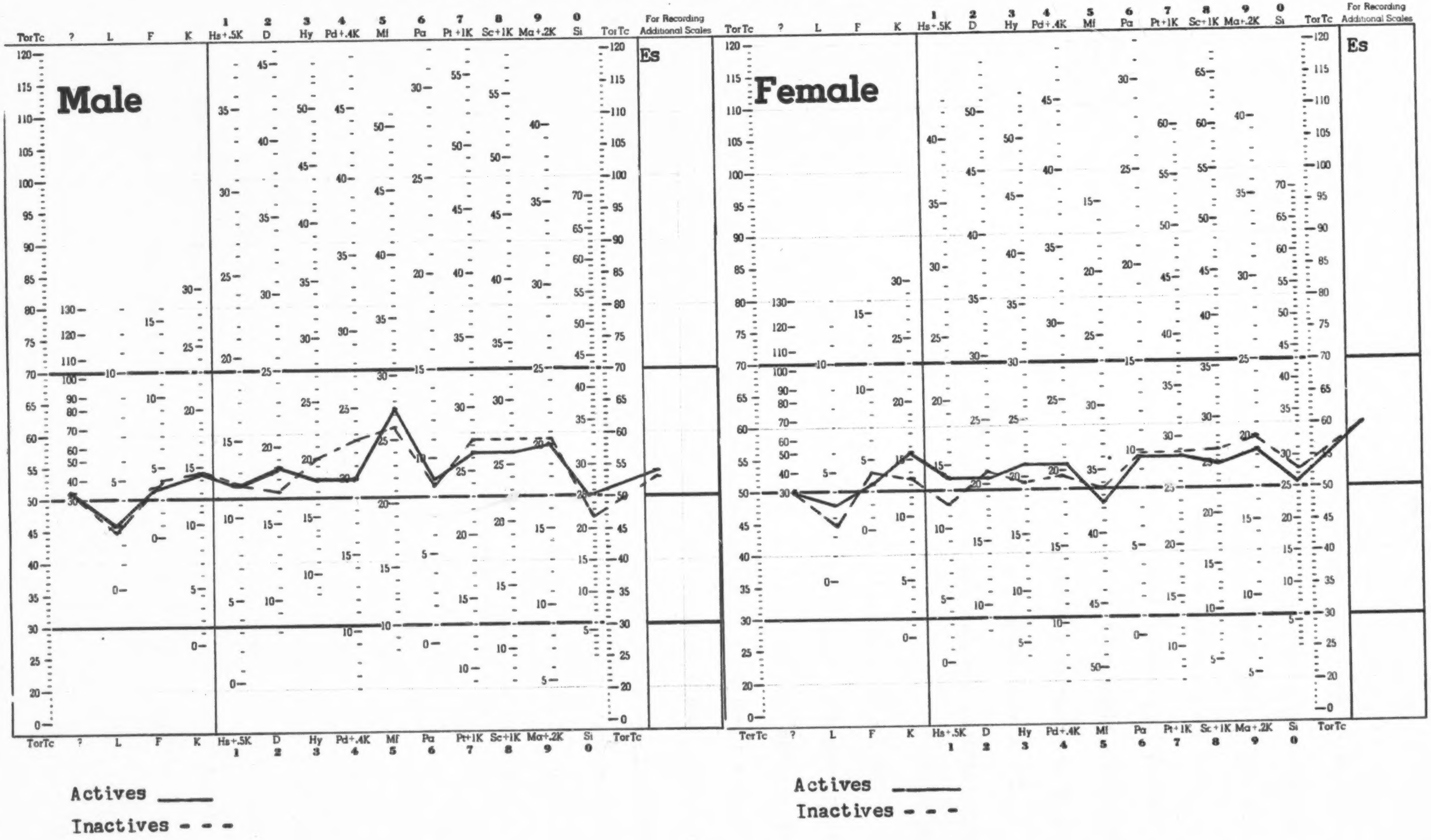
> "this independent development of perception and judgment ... is a major factor in individual success and satisfaction. It is tentatively supposed that such development may be related to the effort the individual has expended in an endeavor to do something well."

The women's groups did score well on the measures that correlated with the P-J scale.

Figure 2 shows the mean MMPI profile scores of the Active and Inactive, male and female students. The reader can note both the general similarity between the profiles of the Active and Inactive students and the distinct lack of any pathological tendencies, as measured by this instrument. A T-score of 70 would represent substantial maladjustment.

Figure 2

The Minnesota Multiphasic Personality Inventory



Few of the average scores of any of these groups even reaches a T-score of 60. As group pattern they portray instead healthy and energetic personalities.

The one significant difference on the male profile occurred on Pd (Psycopathic-deviate) scale. While the mean score of the Inactive men did not reach a level of pathology, it was somewhat indicative of a social alienation tendency. It should be remembered that these scores were taken prior to the experience that the students had at the University of Illinois. For the Active men, the three highest scores were Psychasthenia, Schizophrenia, Hypomania. Such a profile might be interpreted as persons having difficulties in making decisions, lacking in academic motivation but possessing ebullient enthusiasm. None of these scores are at an elevation that would suggest more than slight tendencies, however. For the Inactive men, the high scores were on Hysteria, Psychopathic-Deviate, Psychasthenia, Schizophrenia, Hypomania. Here again, a certain degree of antagonism toward authority may combine with poor decision-making ability and lack of academic motivation to provide the necessary ingredients for a difficult academic adjustment. It must be emphasized, however, that the Active men have a very similar profile. The masculinity scale (MF), although elevated for both groups, was discounted because of the common finding of high scores in college populations.

The one significant difference between Active and Inactive women was on the Hypochondriasis (HS) scale with the Inactive women showing a significantly lower scale than the Active women. This lack of physical symptoms can be related to the positive physical self-portrait of the Inactive women. Both groups of women score high on the ego-strength scale. For the Inactive women, their other high scores were on the Parania, Schizophrenia, Hypomania scales which may represent some tendency towards personal sensitivity and difficulty in decision making. On balance, however there is little to indicate in these profiles why there should be such differences in academic performances in the two groups.

CONCLUSIONS

The overall results of this study revealed little in the way of a significant and consistent pattern of differences between Inactive and Active James Scholars of either sex. It might be that the similarities between the groups, in reality, represent more information of value than the differences! In the comparison of the Active and Inactive men, the differences reaching a significance level included a more positive self-concept of their mental ability in the active group, a better performance on Synonyms-Antonyms on the Terman Concept Mastery test, a tendency towards extroversion on the Myers-Briggs Inventory, and a higher score on the Psychopathic-Deviate scale on the MMPI for the Inactive men suggesting introversion and social withdrawal.

On the other hand, the standard measures of academic preparation, the divergent thinking tests and the majority of the personality inventories showed little to choose between these two groups. In terms of the personality inventories, they presented a portrait of a emotionally healthy and stable male who has high academic aptitude. If there are substantial differences between these groups, they would seem to lie in a more subtle motivational area than in the gross dimensions of pathology investigated here.

The differences obtained between the Inactive and Active women were along substantially different dimensions than those obtained on the men. This result underlines the general conclusion that the problems or factors causing James Scholars to become inactive have to be considered differently for men and women. The Active women felt they had better social relations with their teachers and better work habits than the Inactive women. They performed in a better manner than the Inactive women on the divergent thinking tests and on the ACT social studies examination. The scores on the divergent thinking tests suggested a greater intellectual flexibility and adventuresomeness which would stand them well in performance in a university setting. The Inactive women scored higher on their self-concept of physical abilities and also had fewer physical complaints. Such a pattern might well indicate that the Active women have accepted the life of the mind and while the Inactive women are still placing stress on physical abilities, perhaps as an escape from their academic lack of success.

In terms of similarities, Active and Inactive women have generally the same level of academic aptitude in content areas, performed approximately the same on measures of the Terman Concept Mastery Test and had substantially the same patterns on the personality inventories. In their case, also, there was little evidence to support the notion that substantial emotional disturbance was related to their becoming inactive in the program. Like the Inactive men, the reasons for such disaffection with the program and their limited academic efficiency compared to their aptitude lies in more subtle motivational dimensions or in a miscellaneous collection of variables that may lay outside themselves and have to do with the program or the university in general.

There are many clues and suggestions for further study of James Scholars and superior students in college. One of these is the need to explore the matter of motivation among such talented students. What more is needed for self-fulfillment on the part of these able students than academic success in a large university? Is it possible that the academic life alone is not filling the needs of all of our able students? Another investigation might be made on the effective meaning of the James Program to its Scholars. How well are the participating students relating to the Program and how well is the Program meeting the needs of superior students in this University? On a more personal basis might be considered the contacts of the James Scholar with counselors in the Honors Program--does the Scholar feel he has an adequate opportunity to see a counselor and get meaningful advice and assistance? This degree of contact may have a direct relationship to the problems of the Inactive Scholars who appear to lean to introversion and social withdrawal. From this present study there are indications that a long range study, year by year, of each class of James Scholars might yield significant patterns of development that would show differences between the active and the inactive students, and aid in the refinement of identification procedures.

The continuing need for such a study is underlines by the attrition rate from the James Scholars Program which approximates 50 percent. Bridgman stated in 1961 that:

> "of the young persons of high ability, less than one-half of the men and less than one-third of the women complete an undergraduate college education, the foundation for further training in many professional fields."

Such losses of talent to our society cannot be permitted to go on if our society is to flourish and expand. We must continue striving to find ways to better identify our talented students in all fields, to provide better opportunities for the utilization and expansion of these talents, and to actualize each student so that he feels a sense of fulfillment and belonging that is unique to him in his role in our society. For colleges and universities to meet effectively their responsibilities toward talented students will require much more study and research into the traits, aspirations, and attitudes of such students. This study has been an attempt to define a structure for meaningful research in the future on the area of the superior college student.

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AN ANALYSIS OF THE VERBAL DEFINITIONS OF ELEMENTARY SCHOOL CHILDREN:

A PILOT STUDY

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Presentation of the Problem

Identification of talent in culturally disadvantaged children. Our country is faced with such basic social change that the term "revolution" is an appropriate one. The dilema facing us is the presence of a significant number of socially and culturally disadvantaged persons at a time, more than ever before, when our complex urban society requires all its functioning members to be highly literate, responsive to rapid changes in every area of life and work, and able to learn and re-learn complex ideas and skills as minimal conditions for economic security, social maturity, and independence (Bloom, Davis, and Hess, 1965). As many as 60 million American citizens are merely subsisting in our affluent society; 30 million of them are under 18 years of age. They represent all races and many ethnic groups; only 5 million are Negro. What can education do for the "difficult 30 per cent" who are not being prepared to become effective adults?

No society in today's world, most of all a democratic society, can afford to waste the talents of any of its citizens. Within the difficult 30 per cent there is a sizeable proportion of the youth (perhaps one-third) who can aspire to higher education and who should be enabled to secure this higher education. Because of lethargy, a lack of knowledge, and a lack of sensitivity, these talents have gone unrecognized, and therefore have either atrophied or have been expressed destructively. If opportunities for intellectual development are denied the disadvantaged children of above-average potential, the loss is doubly tragic. To date, our efforts in the early identification of such talent have been inadequate and cumbersome.

Testing and identification procedures have formerly placed undue reliance upon standardized IQ tests, but standardized procedures cannot produce an accurate evaluation of the achievement potential of culturally disadvantaged children. The lower-class child tends to be less verbal, less self-confident, less motivated, less competitive, less conforming, and less knowledgeable about the world than his middle-class counter-part. These factors may be expected to influence test performance in general, and the reliability and validity of test results in particular.

The predictive validity of these tests for the culturally disadvantaged is impaired by (1) test-related factors, including test-taking skills, anxiety, motivation, speed, understanding; (2) complexity of criteria (school grades reflect intelligence, achievement, motivation, behavior, study habits, and previous experience); (3) intervening events and contingencies (significant improvement in educational opportunities and incentives for learning, or lack of such improvement).

Deutsch's hypothesis of cumulative deficit (Deutsch, 1963) asserts that although there are small measurable intellectual differences by socio-economic status at the beginning of school, they become more marked as the child goes through the early years of school. The deficit shows up most clearly in achievement in reading and arithmetic; even general intelligence (obtained from test scores) appears to decline during the elementary school years. Bloom (1964) asserts that if learning is not successful and satisfying in the first three years of school, the entire educational career of the child is seriously jeopardized. The cumulative deficit hypothesis has been further substantiated by McCandless (1952), Kirk (1958), Smilansky (1961), Krugman (1961), and John (1963).

The validity of interpretation of the standardized tests is strongly dependent upon an adequate understanding of the social and cultural background of the group in question. Paucity of language and experience, lack of intrinsic motivation, low reading ability, resistance and/or negativism--these factors must be acknowledged and considered in the administration of such tests to children from the difficult 30 per cent.

Erikson (1950) assigns the developmental stage of Industry versus Inferiority to the early school years. He says the child's danger, at this stage, lies in a sense of inadequacy and inferiority. If he despairs of his tools and skills or his status among his tool partners, his ego boundaries suffer, and he abandons hope for the ability to identify early with others who apply themselves to the same general section of the tool world. . . .Many a child's development is disrupted when family life may not have prepared him for school life, or when school life may fail to sustain the promises of the earlier stages (Erikson, p. 227).

Hunt (1961) supplies the theoretical basis for such statements in his thesis that the belief in fixed intelligence is no longer tenable; that development is far from completely determined; that experience is the programmer of the human brain; and that there is a kind of intrinsic motivation inherent in information processing and action. He sees cultural deprivation as a failure to provide an opportunity for infants and young children to have the experiences required for adequate development of those semi-autonomous central processes demanded for acquiring skill in the use of linguistic and mathematical symbols, and for the analysis of causal relationship (Hunt, 1964, p. 236). He likens cultural deprivation to experiential deprivation in infancy and early childhood.

Thinking can be viewed as only partly controlled by the nature of the immediate stimulus and the available model and guidance. According to Taba (1965), the individual must develop for himself both the conceptual schemes and the processes for using them. The environment and training become available only to the extent that he performs certain operations on what he receives. An individual may, for example, imitate a model of the "if-then" reasoning, but this model remains unproductive unless he internalizes and elaborates this process himself (Taba, p. 537).

Vocabulary has long been considered a useful measure of intellectual ability. Any definition or association has been acceptable however and detailed linguistic analysis has not be executed. The specific purpose of the study is to describe and differentiate the emerging qualities of verbal definitions, as evidenced by language from children at different age levels, from different socio-economic backgrounds, and of average and superior intellectual ability. Its general purpose is to determine the feasibility of further investigation into the qualitative analysis of linguistic definitions.

Procedure

Description of sample. Twelve children were selected from each of three grades in the Champaign, Illinois elementary school system. Six children were from culturally advantaged backgrounds and six from culturally disadvantaged backgrounds in first, third, and sixth grade. The children were matched as to present grade level and first-grade IQ scores, obtained from the California Test of Mental Maturity. Each of the following categories are represented by three children at each grade level: culturally disadvantaged, average IQ (Dis-Av); culturally disadvantaged, superior IQ (Dis-S); culturally advantaged, average IQ (Ad-Av);

culturally advantaged, superior IQ (Ad-S). It was decided to eliminate pupils of the Negro race as potential subjects, since racial membership has been suggested as influencing language acquisition (Dreger and Miller, 1960). Subjects were not paired on sex, due to the difficulty in securing sufficient subjects who met the other criteria. The IQ ranges of the four groups of subjects are summarized in Table 1.

Fathers' occupations were considered the key differentiating factor in determining classification as disadvantaged or advantaged. Occupations were ranked according to the Index of Status Characteristics (Warner, 1960, pp. 140-141), with an additional rank of 8 for welfare recipients. The difference in ranks of father's occupations for the two groups was statistically significant (p=.01), with fathers of the culturally advantaged children ranging from 1-5 with a mean rank of 2.8; fathers of the disadvantaged children had predominantly lower level occupations, with ranks ranging from 4-8, with a mean rank of 6.2.

Table 1

SUMMARY OF CHARACTERISTICS OF SUBJECTS (N=36)

Grade Level	Category	N	IQ Range Disadvantaged	N	Advantaged
1	Average	3	95-108	3	98-105
	Superior	3	118-126	3	129-134
3	Average	3	97-102	3	95-98
	Superior	3	125-134	3	127-131
6	Average	3	90-101	3	94-102
	Superior	3	126-131	3	130-132

Measuring instrument and method. A vocabulary scale was specifically constructed for the purpose of soliciting both quantity and quality of definition. It consists of 24 words selected on the basis of potential for eliciting a number of responses and a variety of meanings from all subjects, regardless of grade level, mental ability, or socio-economic background. Seventeen of the words have been previously used by McCoy (1964); the additional seven were selected from Webster's New World Dictionary on the basis of meeting the above criteria. Each subject was individually administered the vocabulary scale approximately one month before the end of the school year. Responses were tape recorded, and subsequently transcribed for study and analysis.

Comparison of mere fluency has limited value, however, because the quanitity of response may be inversely related to the quality of response. Therefore, a more meaningful concern is the quality of definitions, especially those involving multiple class inclusion and synonymy. Individual responses were classified on the premise that a definition is a statement of a semantic relationship between the concept being defined and one or more other concepts presumed to be known to the hearer and whose properties are relevant to the term being defined.

The four semantic relationships under consideration at this time are: (1) attributive--one or more distinctive characteristics, extrinsic or intrinsic; (2) function--purpose, the means of effecting; (3) synonym--an equivalent of; (4) class inclusion--membership in a hierarchical class (adapted from Casagrande and Hale, 1963). It was assumed that attributive and functional responses could be considered relatively concrete, and that synonym and class inclusion responses could be considered relatively abstract in quality. Samples of stimulus words and resulting relationship category are found in Table 2.

Table 2

WORD SAMPLES AND CLASSIFICATIONS

Vocabulary Item	Classifications Attributive	 Function	 Synonym	 Class
Ring	Round	You wear it	Circle	Jewelry
Foot	Has 5 toes	You use it to walk.	12 inches	Part of body; Unit of meas.
Orange	Round; has juice	We eat it.	Red-yellow	Fruit; color
Block	Square; usually wooden	To keep out cars.	Barricade	Toy

Two raters classified all responses given by ten randomly selected subjects in terms of the above relationship classifications; these ratings were then compared to establish the reliability of the scoring procedure. There was complete agreement between the scorers on the four classifications under consideration, which indicates high internal consistency within the scoring method. The following questions were investigated:

1. Will maturation and experience result in increased verbal ideational fluency, regardless of socio-economic background and IQ score obtained at the first grade level?
2. Will there be a difference in the quality of verbalized thought between children of culturally disadvantaged and culturally advantaged backgrounds, and of average and superior IQ scores, with grade level held constant?
3. Will the IQ scores of culturally disadvantaged children progressively decrease from first to fifth grades?

Results

Total responses. All groups of subjects showed an increase in ideational fluency from first to sixth grade; the Advantaged Average mean score dips at third grade, but makes an over-all increase. The numerical increase per group is as follows: Dis-Av, from 51-97; Dis-S, from 83-99; Ad-Av, from 88-109; Ad-S, from 108-129. Figure 1 presents the mean number of total responses for each group of subjects at each grade level.

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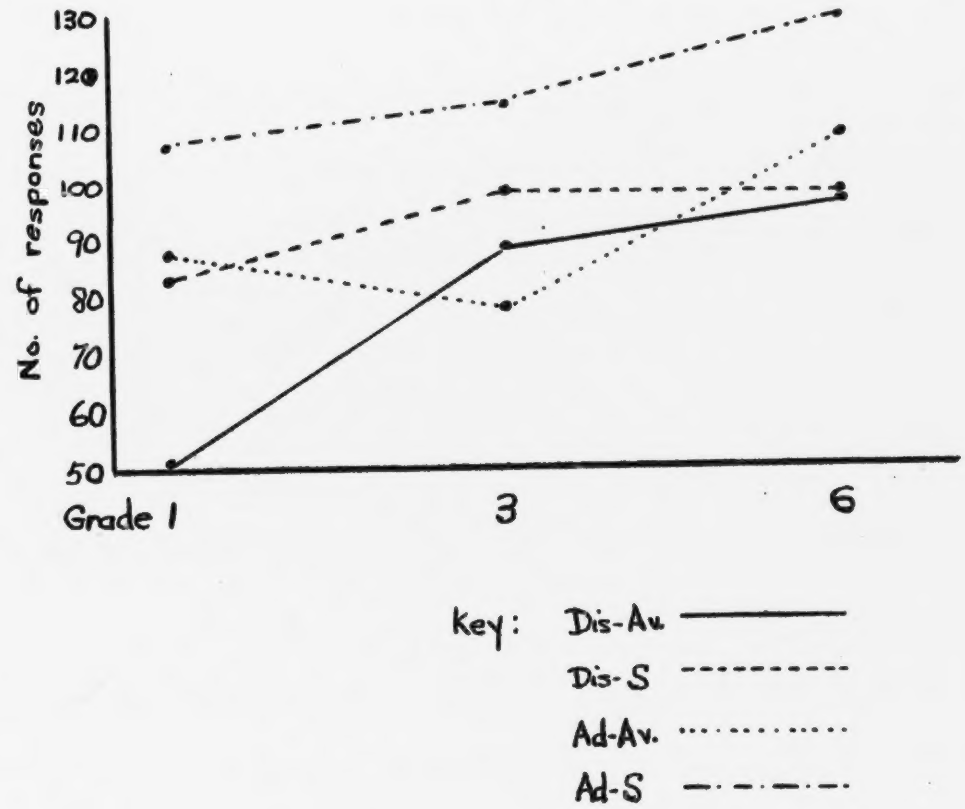
Figure 1.

MEAN NUMBER OF TOTAL RESPONSES
BY GROUP AND GRADE LEVEL



The Fisher Exact Probability Test was used to compare the total number of responses for each group of disadvantaged and advantaged subjects at each grade level. Figure 2 presents the analysis of grade I responses. Differences in number of responses was significant ($p < .05$) at the first grade level; differences at third and sixth grade levels were not significant.

Figure 2

TOTAL NUMBER OF RESPONSES

FOR FIRST GRADE

	Dis.	Ad.	Total
+	1	5	6
-	5	1	6
Total	6	6	12

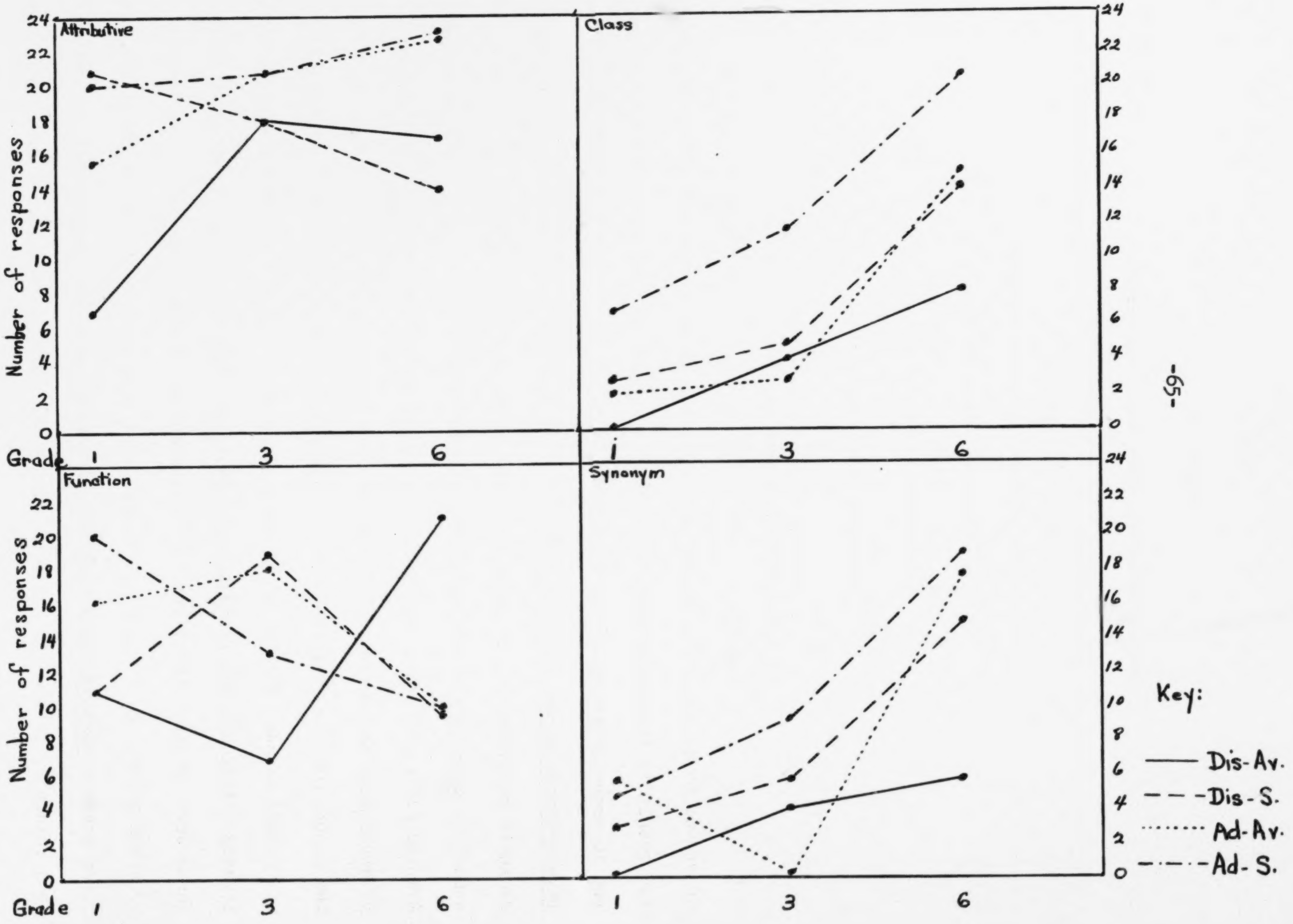
N=12
$p < .05$

In answer to question #1, we may say, for this same sample, maturation and experience did result in increased ideational fluency, regardless of socio-economic background and IQ score obtained at the first grade level.

Developmental curves--use of language. The mean number of responses under each semantic relationship category were tabulated, and are presented in Figure 3. The number of attributive responses from the advantaged groups and the Disadvantaged Average group increased; the number of responses of the Disadvantaged Superior group progressively decreased from first to sixth grade. In this particular relationship, the number of total responses at the sixth grade level was similar for the advantaged groups and similar for the disadvantaged groups. Fluency in this instance is misleading. Although the Disadvantaged Superior first-graders gave the most responses, these were usually repetitive. It would appear that as these subjects progressed to sixth grade, their responses became more differentiated. For example, in the first grade a diamond could have been described as: it's expensive; it costs a lot; it's valuable; it's worth a lot of money; rich people have them. These responses

Figure 3.

MEAN NUMBER OF RESPONSES BY SEMANTIC RELATIONSHIP



would result in an attributive count of 5. By sixth grade, a typical response might have included just one or two of the above under the attributive category, with a resulting count of 1 or 2.

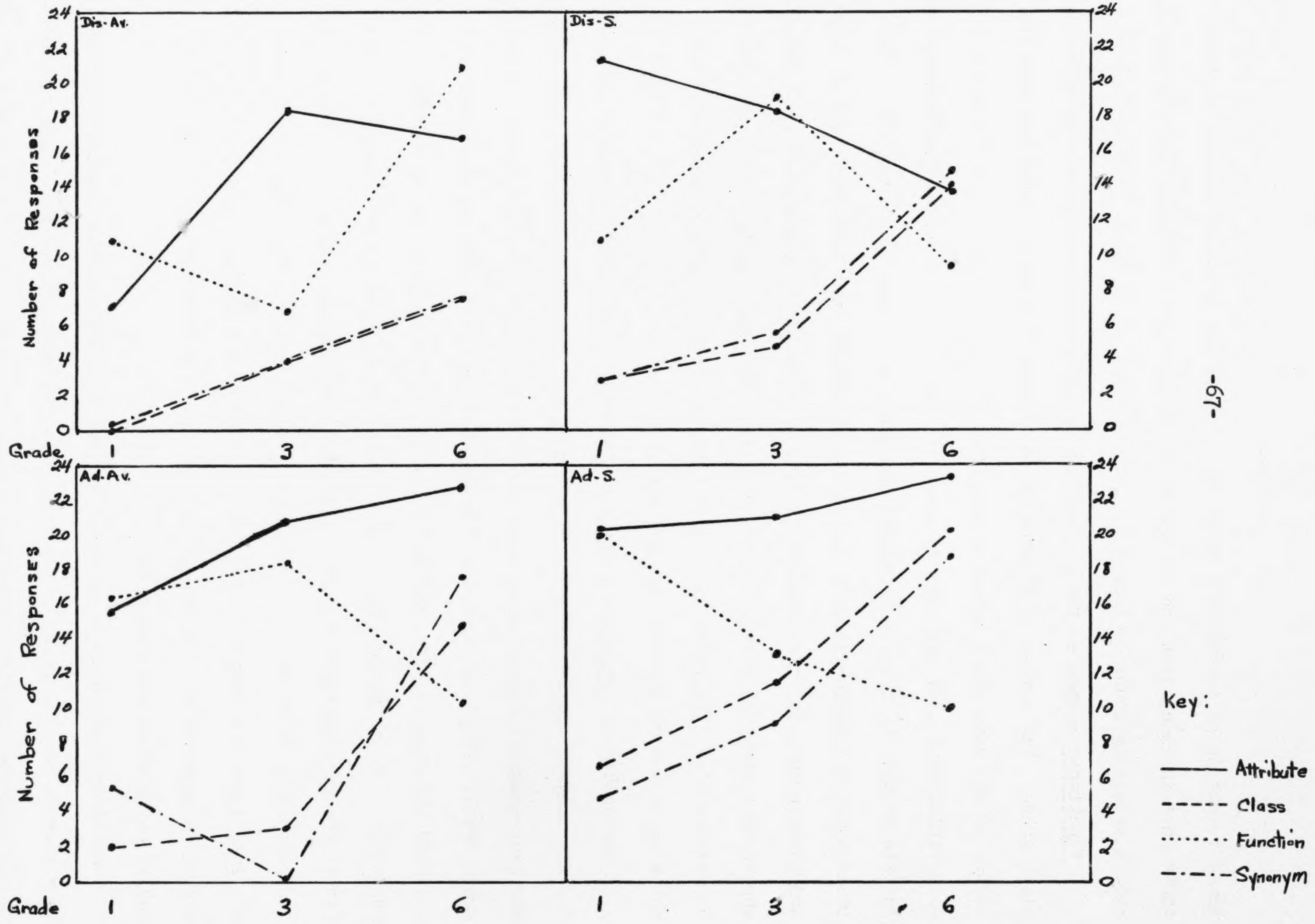
Functional responses for all but the Disadvantaged Average decreased by the sixth grade. The number of Disadvantaged Average responses almost doubled; the number of the Advantaged Superior responses halved. It has been a frequent observation that slow learners respond with predominantly functional definitions; in this study, the Disadvantaged Average subjects followed this pattern. The Disadvantaged Superior group's functional responses almost doubled between first and third grade, but then substantially decreased by the sixth grade. It would appear that three or four years of schooling was necessary to enable the Disadvantaged Superior subjects to verbally express their ability to progress from functional thinking to a more abstract thought process.

The number of synonym and class inclusion responses substantially increased for all subjects in all groups. As would be expected, the number in each of these abstract classifications was highest for the Advantaged Superior groups at each grade level. Responses from the Disadvantaged Superior and the Advantaged Average followed the same pattern, and ended at sixth grade with about the same number of responses. It is interesting to note that for the function and synonym classifications, the Disadvantaged Superior and the Advantaged Average and Advantaged Superior responses show definite similarity at the sixth grade level. The total number of class inclusion responses for the Disadvantaged Superior and the Advantaged Average groups follow the same pattern through the three grades investigated, and at sixth grade are almost the same.

An additional analysis of the responses by semantic relationship is presented in Figure 4. At all grade levels, the Disadvantaged Average gave more responses in the concrete classifications than in the abstract, although the number of responses

Figure 4.

MEAN NUMBER OF RESPONSES BY CATEGORY OF SUBJECTS



in the synonym and class inclusion classifications increases steadily from none in the first grade to 7 in the sixth grade. The Disadvantaged Superior subjects exhibit a definite decrease in the attributive and function categories, and a definite increase in the more abstract classifications. Both advantaged groups showed a preference for attributive relationships, and a decrease in the functional relationship, a trend which was even more marked in the superior group. The patterns of total responses in the synonym and class inclusion relationships are similar for all groups, and show a marked increase from first to sixth grade.

Most and least frequent classifications of responses given by each subject category are presented in Table 3.

Table 3

MOST AND LEAST FREQUENT RESPONSES BY EACH SUBJECT GROUP

Subject Group	Most Frequent Response	Least Frequent Response
Dis-Av		
First Grade	Function	Synonym and Class
Third	Attributive	Synonym and Class
Sixth	Function	Synonym and Class
Dis-S		
First	Attributive	Synonym and Class
Third	Function	Class
Sixth	Synonym	Function
Ad-Av		
First	Function	Class
Third	Attributive	Synonym
Sixth	Attributive	Class and Function
Ad-S		
First	Attributive	Synonym
Third	Attributive	Synonym
Sixth	Attributive	Function

Therefore, in answer to question #2, for this small sample, there were differences in the quality of verbalized thought between children of culturally disadvantaged and culturally advantaged backgrounds, and of average and superior intelligience with grade level held constant.

Cumulative deficit. IQ scores obtained by the culturally disadvantaged subjects on the California Test of Mental Maturity administered by the school system in the first, third, and sixth grades are presented in Table 4.

Table 4

IQ SCORES FROM CALIFORNIA TEST OF MENTAL MATURITY

Subject	Present Grade	First Grade IQ	Third Grade IQ	Fifth Grade IQ
A	3	97	110	
B	3	101	97	
C	3	102	99	
D	3	125	144	
E	3	128	119	
F	3	134	116	
G	6	90	98	96
H	6	99	113	103
I	6	101	127	114
J	6	126	123	104
K	6	129	141	161
L	6	131	145	140

None gave evidence of substantial change downward. In the third grade, one subject went from an IQ score of 125-144; however, another subject went from 134-116. Differences in scores from first to sixth grade follow no pattern; one subject's score decreased from 126 to 104; another's score increased from 129 to 161. The changes in scores for the disadvantaged average group ranged from ± (3 - 13) points. The changes in scores for the disadvantaged superior group ranged from ± (9 - 32) points. The cumulative deficit hypothesized by Deutsch (1963) was not substantiated by the findings of this study. If the findings of this small sample are representative, one must attempt to resolve this contradiction. It is probable that the degree of deprivation represented in this study is not as pervasive as that in Deutsch's investigations. In addition, most of Deutsch's work involved Negro populations, whereas this study encompassed white subjects only. In answer to question #3, therefore, the IQ scores of culturally disadvantaged children did not progressively decrease from first to fifth grade. Because of the limited sample, these findings were not analyzed statistically.

Summary and Conclusions

A pilot study based on verbal responses to multi-definition words of 36 white elementary school children was made to determine the feasibility of further investigation of the influence of cultural disadvantage on linguistic development. Findings of the study were:

1. Maturation and experience will result in increased verbal ideational fluency, regardless of socio-economic background and IQ score obtained at the first grade level.
2. There were differences in the quality of verbalized thought between children of culturally disadvantaged and culturally advantaged backgrounds, and of average and superior intelligence, with grade level held constant.
3. The IQ scores of culturally disadvantaged children did not progressively decrease from first to fifth grade.

The difference of the quality of definitions given by subjects from low and middle socio-economic backgrounds, and of average and superior tested intelligence was thought provoking. Because of the limited number of subjects in each group, no statement can be made at this time regarding the determining factor of this difference. However, findings of this study make it apparent that further investigation, involving a larger number of subjects, might prove worthwhile.

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EVALUATION OF A SUMMER WORKSHOP ON GIFTED CHILDREN

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During the summer of 1964, twenty teachers and administrators participated in a four-week workshop at the University of Illinois on the education of gifted children. This was one of several workshops supported by the Department of Program Development for Gifted Children of the State of Illinois, a division of the Office of the State Superintendent of Public Instruction. The workshop stressed the stimulation of productive thinking in gifted children.

Discussion of the Workshop Program

The twenty workshop participants were selected on the basis of evidence of successful teaching experience of at least two years, aptitude to do successful graduate work as demonstrated by past academic work, and favorable recommendations by persons closely associated with their professional and/or academic work. Preference was given to individuals from school districts with two or more applicants, with the additional stipulation that not more than four applicants from one school district would be accepted.

An important part of the workshop was a demonstration class composed of children who had been in the fourth, fifth, or sixth grades during the previous school year. These twenty children had been identified as gifted children by the school system they attended. Their I.Q.'s, as determined by the Stanford Binet Intelligence Scale, ranged from 130 to 176.

The workshop emphasized the stimulation of productive thought in gifted children. Guilford's Structure of the Intellect (1959) was the theoretical model used. This model describes cognitive behavior as composed of the three dimensions of content, operations, and products. The workshop stressed semantic content, divergent and evaluative operations, and the higher-level products such as transformations, implications, and systems. These specific "cells" of Guilford's model of intellectual performance were selected as being particularly applicable to the characteristics of the gifted in the cognitive realm and those that were, perhaps, most frequently neglected in the classroom.

Demonstration Class Activities[1]

The children in the demonstration class studied early civilizations in Egypt, Greece, and Rome as well as those of the Aztecs and Incas. They compared and contrasted different features of these early civilizations. It was hoped that such experiences would contribute to each child's concept of "civilization". Particular attention was given to activities designed to stimulate divergent thinking. Thus, the unit opened with the children brainstorming about what the word "civilized" meant to them.

Table 1

Daily Schedule of Workshop

Time	Workshop Activity
8:30 A.M.-10:00 A.M.	Observation of Demonstration Class
10:15 A.M.-11:15 A.M.	Discussion of Demonstration Class Activities
11:15 A.M.-12:30 P.M.	Lunch
12:30 P.M.-2:15 P.M.	Seminar on Program Planning for Gifted Children
3:00 P.M.-5:00 P.M.	Academic Class: *The Gifted Child in School and Society*

Table 1 shows the daily schedule followed by the workshop participants. The program was divided into four separate segments. In the morning there was the observation of the demonstration class and teacher discussion of the class. In the afternoon, an attempt was made to broaden the intellectual horizons of the participants with a seminar, devoted to curriculum development, pupil study, etc. and an academic class which gave them a general orientation and background to the area.

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[1] The Demonstration Class was taught by Mrs. Veda Larson, Consultant on Gifted Children, Champaign Public Schools. Mrs. Larson contributed materially to the workshop not only through her demonstration teaching but through the development of curriculum materials, as well.

Next, the children were asked to draw a map of an imaginary continent on which, they were to imagine, an early civilization had developed. The children were to locate three cities and to show latitude, longitude, physical features, and natural resources. If the children desired to include man-made things such as roads and canals, (and some of them did) this was permitted. These maps were collected, examined, and put away. At the close of the workshop, each child's map was returned and he was asked to make any changes he believed would make his imaginary continent more conducive to the development of an early civilization.

The demonstration teacher used the maps of imaginary continents described above for two purposes: to plan subsequent teaching and to evaluate student background and aptitude in this area. Initially, the maps provided the teacher with information regarding the children's present knowledge about the topic. For example, some children exhibited a poor understanding of the effects of latitude on climate and, consequently, the teacher planned some lessons dealing with latitude. When the maps were returned and the children were instructed to make any desired changes, they were given the opportunity to evaluate their own work, in the light of what they had learned during the past four weeks. The changes they made also gave the teacher the opportunity to make some evaluation of how much they had learned about this topic.

As the unit progressed, a variety of classroom organizations was demonstrated. Some activities were for the entire class, others were for individual projects, and certain problems were studied by small groups. The entire group did a choral reading of _When Hannibal Crossed the Alps_ by Eleanor Farjeon. Each child made a calendar of his life that emulated the calendars of the ancient Egyptians. Small groups read and planned for a presentation to the entire class about one early civilization. Their presentation was to be given in some manner other than simply making a report. During the fourth week of the workshop, the class analyzed and discussed the following quotations: "We think our civilization nears its meridian, but we are yet only at the cock crowing and the morning star." (Ralph Waldo Emerson), "Increased means and increased leisure are the two civilizers of man." (Disraeli), and "I reckon I got to light out for the Territory, because Aunt Sally she's goin' to adopt me and civilize me and I can't stand it. I been there before." (Mark Twain).

Teacher Discussion of Class Activities

The plan of the workshop was that the morning would be devoted to the problems of teaching gifted children in terms of specific children and specific situations. The session following the demonstration class was used for discussion and evaluation of what had occurred that day and, at times, for planning for the next day. The workshop participants were, in the opinion of the writer, most observant of the personal attributes of the children. They made comments such as, "Jack plays up to Mike", and "Jay relates easily and well to adults". Other aspects of student behavior did not seem so apparent until attention was directed toward them by requesting that they be observed.

Observation was, at times, focused on certain features of the demonstration class. On some days each workshop participant was requested to observe a certain child and report to the group. At other times, the teacher's questions or one particular type of productive thinking was the area of particular interest. The observations of participants were shared and lively discussions ensued. The demonstration teacher was present during these discussions and explained her objectives and reactions to student behavior.

On some occasions, the group examined the children's written work and, combining their observations and evaluations, made suggestions for future teaching of the demonstration class. An example of this occurred when some of the children located their imaginary continents in latitudes far to the north. The group decided that this incident indicated that the teacher should pay particular attention to the relationship between favorable climatic conditions and the development of early civilizations.

One of the interesting aspects of the small-group work by the children was the fact that there was a three-year spread in the chronological age of the children. This provided opportunities for the workshop participants to observe and discuss differences in I.Q. and/or chronological age.

Seminar on Program Planning for Gifted Children

Afternoon seminars were devoted to discussions of the nature of productive thinking, its function in the classroom, and ways in which programs in different subject matter areas and at different grade levels can be adapted in such a way as to make use of knowledge concerning productive thinking abilities. The stimulation of evaluative thinking was stressed. The participants discussed the teacher's use of evaluative thinking in the classroom: when deciding about the direction of the discussion, weighing participation, making decisions about the degree of pupil interest or understanding, and assessing the effectiveness of their teaching. The importance of objectives was also emphasized. The generalizations from the social sciences presented by the California State Curriculum Commission (1961) were suggested as a possible source for the selection of content goals in the teaching of social studies.

In one instance, workshop participants were divided into small groups and asked to select a generalization from the California Curriculum List, a geographic area, and a grade level. They were given the problem of devising activities requesting divergent thinking that could supply the teacher with information for evaluation at the beginning and at the end of a unit of study.

One group, interested in teaching a sixth-grade class about Tibet, selected the development of the following generalization as an objective: The culture under which an individual is reared and the social groups to which he belongs, exert great influence on his ways of perceiving, thinking, feeling, and acting. They decided that, as an initial phase of the study, the students would be asked to react to the following hypothetical situation: Pretend you are a lone survivor of an airplane tragedy. You have landed in the heart of Tibet. You are taken in by a family with a child just your age. In how many ways would this child be just like you in thinking, feeling, and acting? In how many ways would he be different? (The wording of the two preceding questions was called to the attention of the group. Their intention was to request that the children list ways rather than enumerate ways.) As a closing exercise, the children would be asked to do the following: Write a letter to your parents describing the difference between your life in Tibet and your life at home. Describe the differences in education, religion, government, recreation, and family life.

The Role of the Teacher

The workshop participants discussed the role of the teacher and suggested that the teacher fills many roles. At times the discussion was concrete and centered on personal experiences or the behavior of the teacher in the demonstration class. The role of the teacher in relation to a particular type of cognitive operation was discussed. On one occasion, the group made a list of things that teachers could do to *stop* evaluative thinking by their students. Their suggestions pointed out that teacher behavior in the classroom may facilitate or retard productive thinking on the part of the students. They concluded that the teacher is a part of the classroom environment and also a manipulator of that environment.

On another afternoon, the focus was more general and the group attempted to answer the question, "What is a teacher?" From a list composed by the entire group, each teacher selected what he considered the five most important aspects of teacher behavior. The summation of their selections is given in Table 2.

Table 2

Workshop Participants' Evaluation of Important Aspects of Teacher Role Behavior

Most Frequently Chosen	Percent Chosen
Motivator	75
Educator	65
Counselor	55
Evaluator	45
Model	45
Least Frequently Chosen	
Disciplinarian	5
Mediator	5
Humorist	5
Director	5
Innovator	5

Interpretation of information such as that given in Table 2 is, of course, limited by definition of terms. It appears that there is overlap between some of the suggested roles. If learner and student are combined, the workshop participants seem to consider teachers as principally motivators, learners, educators, counselors, models, and evaluators.

It is interesting to note that, while Havighurst and Neugarten (1957) separated types of teacher behavior into that related to other adults in the school system and that related to pupils, the selections made by this group dealt with behavior in relation to pupils almost exclusively. This could have resulted from the workshop's emphasis on classroom behavior or it may be that this group believed the teacher's role in relation to pupils more important than his role in relation to adults.

Only one person considered "innovator" as an important aspect of teacher behavior. Apparently this group believed the initiation of any type of educational change is not the teacher's responsibility!

Swenson and Parton(1953), after reviewing some of the literature pertaining to the role of the teacher in the classroom, concluded that radical changes are occurring; that teachers are becoming more accepting of pupil planning and less authoritarian. The selections of types of teacher behavior made by this group tend to support their conclusions.

Program Adaptations

Each workshop participant completed a project, for use in his present position, that applied knowledge about productive thinking abilities. Most participants, being teachers, made curricular adaptations and wrote teaching units designed to stimulate productive thinking. These units differed as to the grade level at which they would be used, three through junior high, and content area--Science, Social Studies, Mathematics, English, and Economics. One group planned an inservice program for teachers of gifted children.

Evaluation of Workshop

Recent innovations in education have brought with them the need to train practicing teachers in new methods and content. The summer workshop has been, and continues to be, a popular method used to transmit these new approaches. Most of these workshops offer diversified activities in the attempt to modify teacher behavior in the classroom. The importance of the new methods and content as well as the expenditure of time, effort, and money dictates that some sort of assessment be made. Such evaluation might provide information regarding the relative effectiveness of different aspects of a workshop that could be used for improving subsequent workshops.

Related Research

Interest in developing thinking in the classroom is certainly not new in education. The role of the teacher and the relative merits of various methods in developing thinking have been discussed and studied for years. Socrates described himself as, "a midwife....thoroughly examining whether the thought which the mind....brings forth is a false idol or a noble and true birth". During the 1930's the Eight-Year Study (Chamberlin, 1963) indicated that permissiveness and a flexible curriculum in the classroom are favorable conditions for fostering critical thinking. Henderson (1963) found that secondary students who were taught the principles of logic and experimentation and their use showed greater gains in critical thinking than a control group who had no such training.

More recently, stemming from the work of Guilford (1959), there has been a surge of interest in creativity and divergent thinking as one aspect of creative thinking. Getzels and Jackson (1962) found that students who were identified as highly creative by performance on tests of divergent thinking achieved as well or better than students with higher I.Q.'s but lower creativity. They also found that the highly-creative students received lower teacher ratings and were frequently considered "troublesome".

Taba, Levine, and Elzey (1964) investigated thinking in elementary children and attempted to train teachers how to raise the conceptual level as a concept or generalization is being developed in the classroom. They concluded that:

> ".....the sequences of teaching functions and their effect on student performance leaves no doubt that the nature of the questions has a singular impact on the progression of thought in the class. The questions teachers ask set the limits within which students can operate and the expectations regarding the level of cognitive operations."

Apparently, those teachers who seek high-level thought processes and products from their students more frequently, get them more frequently.

Taba, when training teachers to teach cognitive skills, found individual differences as to the point in training at which insight occurred. She suggests that training and practice might be provided during one year and assessment of results be made the next year.

It is the purpose of this report to discuss three methods used to evaluate this workshop; participant opinion, measured changes in teacher attitudes and a structured interview using the critical incident method.

Participants' Evaluation of the Workshop

Perhaps the most obvious way to obtain information regarding the effectiveness of a workshop is to ask the opinions of the participants. Consequently, on the last day of the workshop the teachers were asked to write answers to the following questions:

1. What did you like best about the workshop?
2. What did you like least about the workshop?
3. What suggestions do you have for the improvement of subsequent workshops?

The opinions of the group become more evident when categorized. Categories representing the opinions of three or more participants, in order according to the number of participants who mentioned it, are given below:

Liked Best

The opportunity to observe the demonstration class
The members of the class
Discussions of productive thinking
The opportunity to work on a project
The cooperation of the staff

Liked Least

The length of the workshop day
The workshop was too short

Suggestions for Improvement

The workshop should be longer. It should last six weeks or longer.
Additional time during the day to work on project.
The addition of more resource people.

The workshop participants seemed, generally, to have had favorable impressions of the workshop but to have felt harried and hurried by the pressure of time. This interpretation was reinforced by the cooperation shown by participants during evaluative activities during the next school year.

Teacher Characteristics

The participants in this workshop were selected from a group of applicants who, in many cases, had been previously selected by administrators and supervisors within their school districts. This leads to questions regarding the selection process as well as to the possibilities of effecting changes. Is this group of teachers really different from other groups of teachers and, if so, how? Can the attitudes and/or behavior of such a group of teachers be changed as a result of a four-week workshop?

The Teacher Characteristic Schedule by D. G. Ryans (1960) was chosen as the instrument with which to measure certain veiwpoints and aspects of behavior. This schedule is a self-report inventory made up of 350 multiple-choice and check-list items referring to personal preferences, self-judgments, activities, biographical data, and the like. It is described by Getzels and Jackson (1963) as "the single most intensive study of teachers to date". Ryans used observer assessments and scores on the direct-response scale as criteria. Then hundreds of item analyses were carried out and scoring keys for the schedule were derived for a large number of teacher groups. The schedule yields scores for nine classes of variables.

The teachers and administrators enrolled in the workshop were given Ryans' Schedule three times: at the beginning and end of the workshop and, again, eight months after the close of the workshop. Five Teacher Characteristics Schedule scores were selected for analysis since they were considered most closely related to the objectives of the workshop:

Teacher Characteristic X--warm, understanding, friendly vs. aloof, egocentric, restricted classroom behavior.

Teacher Characteristic Y--responsible, businesslike, systematic vs. evading, unplanned, slipshod classroom behavior.

Teacher Characteristic Z--stimulating, imaginative vs. dull routine classroom behavior.

Teacher Characteristic R_1--favorable vs. unfavorable opinions of democratic classroom procedures.

Teacher Characteristic B--learning-centered ("traditional") vs. child-centered ("permissive") educational viewpoints.

Table 3 shows the means and standard deviations for each test administration in each of the selected teacher characteristics plus the means and standard deviations for the Elementary Basic Analysis-Survey Samples used by Ryans. This information provides some evidence that selection procedures used by the workshop staff and/or those used by the local administrators and supervisors of the workshop participants have, in terms of these characteristics, really selected a group that is different from the norm. The fact that this group was above average in all of these characteristics may have been a contributing factor to the absence of change between different test administrations. It may be more difficult to effect changes in these dimensions of teacher behavior and viewpoint in persons who already rank high in the given dimensions than it is to effect changes in others whose rank is not so high.

TABLE 3

Group Performance on Ryans' Schedule of Teacher Characteristics

Teacher Characteristic	Pre-test			Posttest		Posttest		Ryans' Survey Sample		
	N	Mean	S.D.	Mean	S.D.	Mean	S.D.	N	Mean	S.D.
Warm vs. Aloof Classroom Behavior	17	54.8	6.3	55.2	5.4	55.6	6.2	1648	48.3	15.5
Systematic vs. Unplanned Classroom Behavior	17	46.1	5.3	45.0	4.8	47.1	5.7	1648	29.8	8.7
Stimulating vs. Dull Classroom Behavior	17	45.9	4.3	46.2	6.2	46.4	5.2	1648	42.7	11.3
Favorable vs. Unfavorable Opinions of Democratic Classroom Procedures	17	53.6	7.0	55.5	8.3	55.3	8.8	1648	31.1	11.0
Traditional vs. Permissive	17	22.7	11.3	21.0	10.9	23.2	12.2	1648	23.8	9.1

TABLE 4

Analysis of Variance of Five Teacher Characteristics as Measured by Ryans' Schedule

Teacher Characteristics

		Warm vs. Aloof Classroom Behavior			Systematic vs. Unplanned Classroom Behavior			Stimulating vs. Dull Classroom Behavior		
Source of Variation	df	Sum of Squares	Mean Square	F	Sum of Squares	Mean Square	F	Sum of Squares	Mean Square	F
Total group	50	1817.7			1728			1512		
Between means of individuals	16	1508.4	94.2	9.9*	1179.0	73.7	4.6*	1219	76.1	8.7*
Between order means	2	5.0	2.5	.26	36.0	18.0	1.1	2	1.0	.11
Error	32	304.3	9.5		513.0	16.03		281	8.78	

Teacher Characteristics

		Favorable vs. Unfavorable Opinions of Democratic Classroom Procedures			Traditional vs. Permissive Viewpoints		
Source of Variation	df	Sum of Squares	Mean Square	F	Sum of Squares	Mean Square	F
Total group	50	3351			6783		
Between means of individuals	16	2256	141.0	4.26*	5645	352.8	10.3*
Between order	2	37	18.5	.56	46	23.0	.67
Error	32	1058	33.1		1092	34.1	

* $p < .01$

Table 4 shows the results of an analysis of variance, randomized-block design, investigating whether the workshop participants changed on the five teacher characteristics from one test administration to another. No significant variations between test administrations were found for any of the teacher characteristics. Apparently the selected dimensions of teacher behavior and viewpoint are fairly stable with this group and a four-week workshop and/or seven months of additional teaching experience were not sufficient to effect significant changes.

Significant differences were obtained on each of the teacher characteristics on variation between teachers. This indicates, as many studies have previously shown, that teachers vary significantly among themselves in terms of viewpoints and patterns of classroom behavior.

Critical Incidents

The critical incident technique was used to obtain information related to some of the specific objectives of the workshop. Flanagan (1954) proposed and used this technique extensively. It is a technique for obtaining a record of specific behaviors (rather than opinions, hunches, and estimates) from those best able to make the necessary observations and evaluations. Such critical behaviors provide a basis for making inferences. The critical-incident technique has been used in a variety of situations such as providing criteria for measures of typical performance and establishing training requirements. It was used by Ryans in his work on the Teacher Characteristics Schedule and is presently being used by the U.S. Air Force in determining the requirements for training for culture contact and interaction skills (Haines, 1964).

Each workshop participant was visited by the writer during March or April, 1965 and interviewed. They knew that they were to be visited and interviewed but they were not told the nature of the questions that would be asked. Each teacher was asked to tell about specific incidents that had occurred in his classroom during the current school year. The types of specific incidents requested were:

> Think of a time (in the classroom) during the past year when you asked your class to do some divergent thinking.
>
> Think of a time (in the classroom) during the past year when you asked your class to do some evaluative thinking.
>
> Think of a time (in the classroom) during the past year when you asked your class to do some thinking that would result in some high-level products such as transformations, implications, or systems.
>
> Think of a time (in the classroom) during the past year when your major objective was to develop initiative and autonomy in your students.
>
> Think of a time (in the classroom) during the past year when your major objective was to develop understanding of a generalization.

In each incident the teacher was questioned as to the type of activity, month during which the incident occurred, and frequency of such activities.

As one might expect, teachers varied as to the apparent ease with which they responded to the interview. Some reported incidents unrelated to each other in time of occurrence or content while others reported incidents in which requests for one type of thinking led systematically to requests for another type within a given unit of study. One teacher reported how she used the results of divergent thinking to request evaluative thinking in a unit on leadership:

> "It was the end of the unit and the children were asked to imagine a country that had once been powerful and was now in a stage of decline. They were given certain conditions in this imaginary country such as unemployment, poverty, and wars in the immediate past. The children were asked to think of the qualities a leader would need to help bring this country back to a position of power. Each individual wrote a list. Then the lists were shared and all were written on the chalkboard.

> "From this accumulated list, the class chose the ten most important qualities of leadership for the given situation. The first five qualities were easily chosen, but then the class argued regarding the parsimony of their choices. They wanted to choose those qualities that were most inclusive. A discussion of the common good arose in this selection process. The children also discussed the personal sacrifices that a good leader might be forced to make. Once the ten most important qualities of leadership were selected, each child chose two leaders that met these criteria. The leaders selected by individuals were combined and the class chose five leaders from this combined list that met the specified criteria. The class chose John F. Kennedy, Winston Churchill, Franklin Delano Roosevelt, Abraham Lincoln, and Mahatma Gandhi as leaders for their hypothetical country."

This fifth-grade teacher of a gifted class used activities in which divergent and evaluative thinking were requested as an opportunity for the children to synthesize and apply previously learned concepts. At the same time they were supplying the teacher with information for evaluating the effectiveness of the unit.

An interesting feature of the critical incidents reported was the content areas in which the reported incidents occurred. Table 5 shows the frequency of different content areas in the five types of incidents reported. Sheer variety of content areas for the specified types of incident is a matter of interest. It is also noteworthy that incidents designed to develop initiative and autonomy, the only non-cognitive variable among the incidents requested, show the greatest spread among the content areas. A glance at the table reveals that social studies is the content area most frequently mentioned. This information seems to indicate that the teachers involved found they could apply concepts learned more easily in the content area observed in the demonstration class than they could in other content areas. The content-area spread of the one non-cognitive variable suggests the possibility that these teachers were previously more familiar with this variable than the cognitive variables. This conclusion is reinforced by the fact that this variable was dealt with only indirectly during the workshop; it was noticed in relation to the characteristics of gifted children.

Table 5

Number of Critical Incidents Reported by Workshop Participants in Various Content Areas

Spring, 1965

	Critical Incidents					
Content Area	Divergent Thinking	Evaluative Thinking	High-level Product	Initiative Autonomy	Generalization	Total
Social Studies	9	10	9	5	10	43
Science	2	2	1	5	2	12
Language Arts	4	3	3	4	2	16
Mathematics	1	1	2	1	2	7
Physical Education	0	1	0	1	1	3
Art	1	0	0	0	0	1
Miscellaneous	0	0	1	1	0	2
Total	17	17	16	17	17	84

Table 6

Teacher Judgment of Frequency of Requests for Type of Student Behavior Reported in Critical Incidents

Spring, 1965

	Critical Incidents					
Frequency of Request	Divergent Thinking	Evaluative Thinking	High-level Product	Initiative Autonomy	Generalization	Total
Daily or more often	7	7	3	6	4	27
Two or three times a week	7	3	3	3	4	21
Weekly	3	7	4	3	4	21
Once a month	0	0	1	2	3	6
Monthly	0	0	2	1	2	5
Seldom	0	0	2	2	0	4
None	0	0	1	0	0	1
Total	17	17	17	17	17	85

Table 6 shows the frequency with which the teachers sought from their students, the various types of intellectual performance and attitudes requested in the critical incidents. More than half of the teachers reported that they make these types of requests weekly or more often. Comparison of the frequency with which divergent and evaluative thinking were requested with the other types of incident seems to indicate greater familiarity with operations than the other variables. The interviewer believed that the teachers found incidents illustrating high-level products the most difficult type to report. The range of the frequency with which the teachers request this type of cognitive behavior may reflect such an unfamiliarity. This interpretation is strengthened by the fact that all of the incidents of this type requested one kind of product, implications. Information gathered through the critical-incident interviews seems to show that the teachers acquired a degree of sensitivity to a model of productive thinking and were able to use their knowledge in the classroom.

Summary and Conclusions

On the whole, workshop participants reported favorable opinions of the workshop with the exceptions of the length of the workshop day, which they believed was too long, and the four-week period of time, which they believed was too short. While no significant differences were found in the selected teacher characteristics measured pretest and posttest by the Ryans' Schedule, the group mean at all measuring times was higher than that of the survey sample on dimensions of warmth, systematic planning, imagination, favorable attitude to democratic procedures and learning-centered. Critical indicents in the classroom reported in structured interviews indicated a growing familiarity with a model of productive thinking. They tended to report activities which reflected the thinking operations stressed in the workshop and in the content area of the workshop (social studies). All of the participants requested feedback of the information gathered for workshop evaluation. Perhaps one of the values of an assessment such as this, if the participants are aware of long term assessment, is the reinforcement of knowledge and skills previously learned.

Information obtained in this evaluation and the inferences drawn lead one to certain conclusions and suggestions that may be of value to persons planning similar workshops.

1. Four weeks seems to be too short a period of time for the type of task undertaken in this workshop. Workshops such as the one described should probably be of six or eight weeks duration.

2. A demonstration class is an extremely important part of a workshop such as this. Workshops should include a demonstration class, if possible.

3. Attention should be given to the application of principles in many different content areas. While only one or two content areas can be dealt with in the demonstration class, examples of questions seeking divergent thinking, etc. in other content areas could be given and teachers could be asked to generate their own examples.

4. The products dimension of Guilford's *structure of the intellect* may be more difficult to learn and apply than the other dimensions of his model. Observation and discussion of a variety of examples from the demonstration class might be helpful.

5. Finally, follow-up services by workshop staff during the next school year might be a valuable contribution. Teachers need to practice over a period of time in order to understand a model for productive thinking and use it to consciously stimulate productive thinking. Perhaps a summer workshop can best serve as a "directional signal" initiating steps along a desired path.

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Developing a Social Studies Curriculum for Teaching Values in the Elementary School

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Man is unique in that he has the ability to think, to reflect, and to choose. Social Studies is the study of man and the worlds in which he lives. If man is a thinking creature we really cannot study about him unless we know what he thinks is important, why he thinks it is important, and in what way his behavior is effected by his beliefs. Yet we continue to ask each other "should the schools teach values?" The question raises the anxiety level of both teachers and parents because we aren't sure how we can teach "values" and still preserve freedom of thought and choice. This paper is intended to explore some of the conflicts on the issue of teaching values and to suggest some ways to seek solutions.

Goals of Education

In general statements of goals of education and in listings of goals for the teaching of social studies, the study of moral values is considered to be part of the task of the public school. Allen and others (1962) in a statement prepared for the National Council for the Social Studies says:

> The ultimate goal of education in the social studies is the development of desirable socio-civic and personal behavior. No society will prosper unless its members behave in ways which further its development. Men's behavior tends to reflect the values, ideals, beliefs, and attitudes which he accepts. As used here, beliefs are convictions which tend to produce particular behavior in given circumstances.

The Educational Policies Commission's document of 1960, What is the Central Purpose of American Education? in which the central purpose is stated as the ability to think, is criticized by Brameld (1961) for compounding present bewilderments and inviting evasion of responsibility. He commends the Commission for their statement:

> The development of ethical character depends upon commitment to values; it depends also upon the ability to reason sensitively and responsibly with respect to those values in specific situations... In a free society, ethics, morality and character have meaning to the extent that they represent affirmative, thoughtful choices depends on awareness of values and of their role in life.

However, Brameld points out that the statement is incomplete. The Commission, though urging teachers to achieve rationally grounded commitment to values, is unwilling to attempt a demonstration of choice or commitment, and fails to take a clearcut stand in its philosophy of rationality. He insists that education cannot retreat from leadership and that the paramount goal is world civilization.

A Changing Society

In a dynamic and rapidly changing society diffusion of knowledge is an accepted social goal and the need to educate for flexibility and adaptability is heightened. But we are caught in a dilemma which Oliver (1960) points out as the struggle between the societal need for unity and cohesion and sense of mission as against the individual need for diversity and freedom.

In our society we pride ourselves in the belief that the individual is free to make choices. The heart of morality is personal responsibility of the individual for his own actions as these actions affect himself and others. However, the structure of values of the individual was learned through socialization from the significant "others" in his life. As society becomes more complex and the groups of "others" become more varied and increase in number, it is more and more difficult for the individual to determine where his responsibilities lie.

In considering problems in moral education Niblett (1963) says that the individual in a changing society is called upon to make many more moral decisions than he would in a stable society. Without convictions on the part of someone about the existence of right and wrong there is little basis for morality. Life would be unendurable if each of us had to fight a moral battle on every issue. During a period of rapid change decisions about what he ought to do are left more and more to the individual, and his most easy defense is to make as few decisions as possible. The schools cannot sidestep moral issues by avoiding involvement in life. Niblett believes that the individual must act for himself, but he needs the backing of thoughtful and understanding public opinion.

Indoctrination

How can the school teach values without imposing values? Garforth (1962) tells us that value judgments are written into the human situation and pervade our lives at every point. Necessary indoctrination is unavoidable and can be applied to good or evil ends. We may train people to resist indoctrination, to examine and assess ideas. The influence of the physical, emotional and intellectual content of the society in which we grow up happens anyway, so it is better to give positive guidance by direct teaching or by environmental control than to leave people entirely at the mercy of unpremeditated or unforeseen influences.

Reeves (1963) speaks of the need for hard and soft elements in the educational environment for the growth of the person. "If all the world were hay and no child could ever bang himself hard against a solid piece of stone, what a nightmare of softness that would be! And at far deeper levels than the physical we need the obstinate resistance of that which is not ourself." Three of the inevitable hard experiences with which the growing person must cope are: (1) the acceptance of the given - parents, families, the environment into which we were born, the resources of one's own personality, the opportunities offered, and ones' self; (2) acceptance of the fact that to achieve anything worth-while involves sustained effort; and (3) the acceptance of the idea of the narrowing process in which to choose one thing means renouncing something else. Though we like to believe that we are the masters or our destiny, we live within limitations of many kinds. Every-day decisions are forced by the fact that we cannot be in two places at one time. Perhaps it is because of the many restrictions within which we must operate that we value so highly and guard so carefully the areas in which we have freedoms of choice.

On the personal level we face a dilemma something like this - if I have the right to make my own choices, then I must grant to others the same right which means that I must be careful not to impose my choice on another person because he has to make his own decisions. If I am too careful of the rights of others I might never be able to stand up for my own beliefs. On the other hand responsibility to a commitment means I must take a stand on some issues.

From the existentialist point of view, according to O'Neill (1964), it is far more important that "a child be taught to be moral - that he become capable of moral choice, and hence, become fully human - than that he be right in the sense of conforming to the established dictates of society."

On the societal level we are urged to teach American ideals of liberty and equality and to translate them into specific actions. But if this is done, Oliver (1960) points out that there is danger that we have created an ideology to be imposed. It is possible that vague and ill-defined values help preserve freedom and individuality!

The Conference on the Ideals of American Freedom and the International Dimensions of Education (1962) calls for an organized national effort to define more clearly the fundamentals of freedom. The spirit of freedom and responsibility must be discovered and applied by each generation.

As educators we need to clarify our own thinking in regard to the meaning of values, attitudes and beliefs and to consider how we might provide opportunities for reflective thinking and practice in applying moral principles to human behavior. We need to know our own convictions and take responsibility for them, without attempting to impose them on others.

Need for Re-structuring Curriculum

In the elementary school, teachers have felt that the social studies curriculum has been inadequate. Bruner (1960) has urged that content and teaching materials be rewritten so that the pervading and powerful ideas and attitudes are given a central role, and that basic concepts be matched with the levels of capacities of students of different abilities. The several disciplines of the social sciences constitute a great quantity of knowledge from which to abstract the fundamental ideas. The writer proposes that a social studies curriculum might be built around a study of ethics, and that the development of such a curriculum will require the cooperative efforts of philosophers, social scientists, psychologists and elementary school educators.

Some social scientists believe that values should not be taught in early grades as young children are not capable of reflective thinking - that is, the beliefs of young children are acquired uncritically. In discussing the teaching of values for elementary school children it is necessary to look at the research on moral development.

Moral Development

Kohlberg (1964) describes research on morality as a set of cultural rules of social action which have been internalized by the individual, and stresses three different aspects of internalization as behavioral, emotional, and judgmental aspects of moral action. Kohlberg describes Piaget's studies in which moral judgment is highly correlated to age with intelligence controlled. The studies demonstrate that development of moral judgment in children is in many ways the same, regardless of nationality, class, peer group, or sex. Although middle-class children were more mature, they seemed to move through the same sequence as working class children but at a faster rate. Participation in multiple groups, as the family, peer groups, etc., stimulate the development of basic moral values. Various people may make different demands on the child, but do not seem to present the child with basically conflicting general moral values. That is, the conflicts between demands constitute the material for the discrimination and development of values.

In Piaget's (1932) study he contends that morality consists in a system of rules and that the essence of all morality is to be sought for in the respect which the individual acquires for these rules.

> Children's games constitute the most admirable of social institutions. The game of marbles, for instance, as played by boys, contains an extremely complex system of rules, that is to say, a code of laws, a jurisprudence of its own. (p. 13)

Piaget tells us that the child learns from adults most of the moral rules that he will respect. The game of marbles is handed down from one generation to the next but the relationship exists between children, that is, the older boys teach the younger boys. Society is nothing but a series of generations exercising pressure upon the one which follows it. As the influence of the older generation becomes less in our society, and as the society becomes more complex, the personality becomes more autonomous and cooperative relations between equal individuals become more important.

Piaget talks of two kinds of morality: (1) morality of constraint, which has to do with duty and is subject to the rules of others; and (2) morality of cooperation, which has to do with solidarity, with emphasis on autonomy and on intentionality, and thus on subjective responsibility.

Havighurst's theory of the psychology of character development describes five stages of behavior as (1) the amoral, impulsive stage, which occurs in the first year of life; (2) the egocentric, expedient stage, occurring normally at ages two to four years, seeks satisfaction of his own desires; (3) the conforming stage, occurring between the ages five to ten years, in which the individual conforms to the demands and expectations of the social group in which he lives; (4) the irrational conscience stage, also occurring between the ages from five to ten years, in which the inner moral values are absorbed without change or criticism from teachings of parents and others; and (5) the rational conscience stage, in which the individual becomes emotionally and intellectually independent of the older generation, and is able to choose among alternatives and to understand consequences of his behavior. Havighurst points out that there are adults who have not progressed beyond the second, third, or fourth stages.

Though most primary school children are in the stage of development of conforming to expectations of adults, and of accepting values without critical evaluation, they may move more easily into autonomous behavior if they were given practice and preparation in the process of making value judgments.

As the young child is so susceptible to pressures from others it is even more important in the early grades that the teacher is aware of the kinds of influence she exerts.

Values are taught

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Values *are* taught

Values are taught in the classroom whether or not we intend that this be so. Values are taught in the very atmosphere of the school. Values are taught in every class from physical education to philosophy courses, because communication between human beings at some point impinges upon areas of valuation. Values are taught by example and by the attitudes of the teacher in the classroom, by the kind of opportunity the teacher gives for student participation. The teacher shows his respect for the individual in the way he accepts and understands the feelings of students, in the way he supports and encourages students, or in the way he rejects or criticizes students.

Values are instilled by means of the very words used in communicating. In the classroom the everyday language of the teacher is value oriented as, for example, "work hard," or "nice and clean." In mathematics Beberman (1958) advocates the necessity of precision of language. In the social sciences and behavioral sciences it is necessary not only to be sure that what is being said is true in the sense of being fact rather than rumor or prejudice, but also that the words used convey the meaning intended. Gayer (1964) discusses unplanned value sabotage which may occur when a word is made ambiguous by the way it is used. For example, a teacher sometimes uses the word "may" when she really means "must". Gayer is pointing out that it is unfair for an adult to imply freedom of choice in a situation in which the expected action is mandatory. Thus a distinction should be made between the permissive and the mandatory so that the child will be prepared for laws both commanding and forbidding certain courses of action as well as areas in which he is expected to exercise responsible choices.

A Hierarchy of Values

As it seems impossible to avoid teaching values, consideration was given to the possibility of developing a hierarchy of values. Maslow (1960) contends that it is possible to have a descriptive, naturalistic science of human values, that it is possible to discover which values men tend toward as they improve themselves, and which values they lose as they get sick. He believes that the higher values are those which are found as free choices of healthy people when they are feeling at their best and strongest.

Maslow has discussed, in Motivation and Personality (1954), a theory of need gratification which he describes as being the most important single principle underlying all healthy human development. He discusses a hierarchy of needs in which some needs are prepotent in that some basic needs must be satisfied before it is possible to consider the next set of needs. As one set of needs are fulfilled, another set emerges.

The Basic Needs:

Physiological needs

Though not entirely isolable, these needs are most prepotent. If these are unsatisfied, all other needs are pushed into the background. Life-and-death hunger will rule out all other needs.

Safety needs

In extreme danger, safety alone matters.

Belongingness and love needs

Love and affection, friends, family.

Esteem needs

High evaluation of self, self-respect and esteem of others.

1) strength, achievement, adequacy, competence, confidence, independence, freedom.

2) reputation or prestige
status, dominance, recognition, attention, importance, appreciation.

Need for self-actualization

> The need for doing what one is fitted for...what a man can be - he must be.

Cognitive needs

> Desire to know and understand
>
> To understand, to systematize, to organize, to analyze, to look for relations and meanings, to construct a system of values.

Aesthetic needs

> A need for beauty, for order, symmetry, closure, completion of the act, system, and for structure.

In Defense and Growth (1956) Maslow discusses the relationship between safety and growth pointing out that growth takes place in small steps and is made possible by the feeling of being safe. The child cannot be pushed; unless his safety needs are gratified he will not have courage to move ahead.

> Ultimately the person, even the child, must choose for himself. Nobody can choose for him too often, for this itself enfeebles him, cutting his self-trust, and confusing his ability to perceive his own internal delight in the experience, his own impulses, judgments, and feelings, and to differentiate them from the interiorized standards of others. (p. 47)

The need for safety is so basic for children that if the child is faced with a choice between the "other" and the "self" ordinarily he will choose safety rather than independence.

> If adults force this choice upon him, of choosing between the loss of one vital necessity or another necessity, the child must choose safety even at the cost of giving up self and growth. (p. 50)

The developmental structure of these needs is such that the average child of school age should have established satisfaction of physiological, safety, and belongingness needs within the family. Though teachers should be aware of these needs, probably the school is concerned more with development of the fulfillment of needs for esteem, self-actualization, and cognitive and aesthetic needs. Recognition of the requirement for satisfying these needs play an important part in the development of values, but the hierarchy of needs does not develop logically into a hierarchy of values applicable to everyone. Values are not additive. A particular value commitment can take precedence over even the most basic need. Unless this were so we would have no reason to believe a man would risk his life to save another.

Lists of Values

Perhaps lists of values might be made as (1) values which seem to be generally accepted; (2) values which seem to be accepted but about which there are disagreements about methods of application or implementation; (3) values about which there is no consistent agreement. A discussion of "The Place of Values" is very well handled in the Handbook for Social Science Teachers, First Edition - 1965 by the Greater Cleveland Social Science Program in which it is stated:

> At the elementary level, the highest priority in social science is the discovery of correct moral values and the encouragement of habitual application of those values. Note the words "discovery" and "encouragement."

A short list of values recommended as some of the moral values to be discovered include such concepts as justice, loyalty, courage, self-respect, kindness, moderation and tolerance. Although these concepts would be generally acceptable, one finds, in attempting to develop differentiated lists, that it is difficult to name any value about which there would not be some disagreement as to implementation. Any value taken to an extreme may no longer be acceptable. The problem of how to translate the concept into specific action in specific instances is still undetermined.

A value is something which is chosen freely through gathering of much information and relating and coordinating of knowledge so that the understandings "go together" and become a part of the value structure of the individual. Festinger's (1957) study demonstrates that the individual strives toward consistency within himself. His opinions and attitudes, for example, tend to exist in clusters that are internally consistent. One element in teaching values would be to look at inconsistencies between values.

A Method or Process

How can the school cope with the fact that different individuals may have a different set of values? If the art of morality lies in deciding, how does one go about making decisions or choices? Rather than decide on a particular set of values to teach children, let us describe a method for teaching evaluation, and provide opportunities for examination and discussion of alternatives, and practice in decision making.

Several kinds of thinking processes or operations are available to us and we need to be able to distinguish differences among the kinds of thought processes. Guilford (1959), through experimental application of factor analysis, has identified 120 different factors of intellectual abilities. Classifying these factors according to the kind of process performed gives us these five groups of intellectual abilities: cognition, memory, convergent thinking, divergent thinking, and evaluation. Cognition means to "know", to recognize. Memory means recall or retention of what was recognized. New information may be generated from known information and remembered information through divergent thinking or convergent thinking. In divergent thinking we seek variety, different direction and new combinations of ideas. In convergent thinking we synthesize information to find one recognized best answer. In evaluation we make decisions as to adequacy, suitability, or goodness of ideas and objects we know and remember.

In Gallagher's study (1965) of productive thinking of gifted children, an analysis of classroom interaction showed that cognitive-memory questions made up 50 per cent or more of the total questions asked by the teacher. In many teaching situations it is desirable to structure classroom interaction toward convergent thinking or the gathering of information to produce the correct answer. However, if we wish to teach children decision-making we need to make use of divergent and evaluative thinking processes. We use divergent thinking to disengage the mind from the familiar patterns, to expose the fact that there are alternatives other than the arrangements we are used to. We use evaluative thinking to analyze and examine choices we make, to develop awareness of the differences between value statements and definitions, and to separate observations from interpretations or inferences.

Thus a method for teaching values would include creating an atmosphere in the classroom which would provide opportunities for divergent and evaluative thinking. The teacher may attempt this through the use of an indirect approach, that is, accepting the ideas and feelings of students; through the use of an inductive method, that is, the use of problem situations or descriptions of specific instances which lead students to make their own generalization or value judgment; by asking questions requiring divergent thinking to open discussion to many alternatives; and by asking questions requiring evaluative thinking to examine reasons for choices and predict consequences. Techniques to be used include role-playing, use of puppets, dramatization, as well as group discussion. A discussion might be structured in this way:

Presentation of Problem Situation in which a choice is offered and a decision is necessary.

Questions for discussion:

- What do you need to know in order to make a choice?
  - Are there reasons for the choice or is it a matter of personal preference?
- What resources do you need in order to make the decision, or to implement the choice?
- What will it cost in terms of time, money, energy, etc.?
  - What other "costs" might be involved?
- What might happen if you take this action? If you don't take this action?
  - What might happen if alternate actions are selected?
- If you make this choice, is it consistent with other value judgments you have chosen in other situations?

Examples of such problem situations are given below and are intended as samples of the kinds of material which might be developed.

There are many implications in regard to the teaching of values which have not been included in this paper, such as the administrative organization of the school, the involvement of the community, in-service training of teachers, or specific consideration of the needs of gifted children. I have made value judgments in selecting the sources and recommendations in this paper, and you will make value judgments in your reaction to my suggestions. The subject is complex and laden with emotion. To question your system of values is to attack the most vital part of you. To give you the right and opportunity to re-arrange your structure of values to be meaningful to you is to offer you the deepest personal respect.

EXAMPLES of PROBLEMS, QUESTIONS, and PROJECTS

Intermediate Grades

Problem Situations	Objectives
If you are going on a camping trip down the Mississippi River, what will you bring? If you made the same trip in the 18th century, how would it be different?	Shelter, food, clothing Human Relations
It is the year 2020 A.D. The XXX Foundation has granted money for a research project to study community like in a planned city on the ocean floor. All material arrangements (food, housing, transportation, communications) will be available to start this city. You are the Steering Committee for this project At this meeting you are to make policy decisions in the identification and selection of the population of the first city under the sea. Before you can make decisions, what are some of the problems you must consider?	Social structure Social Institutions Family Religion Economic Government
What are some of the ways in which we might use atomic energy for peaceful purposes. What will atomic power do? (dig a hole) It has power many times the power of dynamite. Why might we want to dig a hole great enough to use atomic power? (canals, harbors)	Peaceful uses of atomic energy Natural resources Technological improvement
International Airlines has received a message that a bomb is aboard a pland scheduled to take off. The Airline officials order that the plane be delayed so that it can be searched. All passengers and their luggage must be searched for a possible bomb. One passenger says that he refuses to allow his suitcase to be opened as this is an infringement on his property.	Rights of the Individual Common Good

Intermediate Grades

What would happen if -

houses were built without inside walls?

there were no families?

someone gave you a money tree to plant in your backyard?

all the metal in the world were used up?

someone discovered a pill to make everyone equally intelligent?

a rule was made in your city that only people with green eyes could ride on the bus?

a rule was made in your school that only persons wearing a scarlet tie could use the drinking fountain?

Cultural Diversity

International Fair

A university holding such a fair would open the exhibits to elementary school classes.

Traveling Exhibits of Intercultural Materials

Agency through which a foreign student might visit schools on contractual basis to demonstrate exhibits from his country or to talk about his country.

Class should spend time before visit to determine the kind of things they want to know about the country.

Social Science Fair

Elementary school students collect materials from other countries.

Exchange of teachers (with the consent of the teachers involved)

Between grade levels

Between school districts
  in the same area
  in different parts of the country

Between countries

Visitors from other countries to talk with the class

Foreign students or foreign visitors
Americans returning from the Peace Corps or other foreign assignments.

Conservation

Outdoor Recreational Facilities

Visit nearby outdoor recreational facilities, forests, parks, including state parks and national parks, rivers, lakes, etc.

Why have these areas been set aside for the public?
How adequately are they maintained? By what means?
Are improvements needed?
Are facilities sufficient for population?

Some Materials Sources

Human Relations and Audio-Visual Materials (see source list)
Jean D. Grambs
The National Conference of Christians and Jews
43 West 57th Street
New York 19, New York

Human Relations Programs
The National Conference of Christians and Jews
203 North Wabash Avenue
Chicago, Illinois

Childrens' Books to Enrich the Social Studies
National Council for the Social Studies
1201 Sixteenth Street, N. W.
Washington, D. C.

The Junior High School Association of Illinois
101 Examples of Creative Teaching in the Junior High School
The Interstate Printers and Publishers, Inc.
Danville, Illinois

Improving the Teaching of World Affiars: The Glen Falls Story
National Council for the Social Studies
1201 Sixteenth Street, N. W.
Washington, D. C.

Invitations to Thinking and Doing
R. E. Myers and E. Paul Torrance
Perceptive Publishing Co.
2795½ Central Blvd.
Eugene, Oregon

Your Face is a Picture
E. C. Seale & Co., Inc.
1053 East Fifty-fourth Street
Indianapolis, Indiana

Materials and Sources of Information
Teaching International Relations
NCA Foreign Relations Project
Suite 832, 38 South Dearborn Street
Chicago 3, Illinois

Teaching Gifted Elementary Pupils How to Do Research
E. P. Torrance and R. E. Myers
Perceptive Publishing Company
2795½ Central Boulevard
Eugene, Oregon

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The Development of a Program of Sentential Logic for Gifted Students

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Can lessons in logic be developed so that students understand what is necessary to state a true generalization precisely? Can college capable junior high school students successfully complete these lessons? These questions were formulated because of some trends and issues in mathematics education. An attempt to answer these questions involved three phases of work:

1. Survey of existing materials.
2. Development of logic lessons.
3. Tryout of the lessons.

There has been emphasis placed lately on teaching the basic structure of subject matter (Bruner, 1960). This is true, in particular, in the field of mathematics. The structure of any branch of mathematics contains the axioms which are assumptions and the theorems which may be proven from them. These axioms and theorems may be stated as generalizations.

Some contemporary mathematics educators feel that it is desirable for students to discover for themselves as many mathematical generalizations as possible. While most agree on the desirability of discovering mathematical generalizations, opinions differ on the desirability of immediately verbalizing these discoveries. Hendrix (1961) states the newly discovered generalizations should be left on a nonverbal awareness level. She contends that verbalization may even be harmful to the dynamic quality of the learning. Beberman (1958) seems to support this contention by pointing out that immediate verbalization has the disadvantage of giving the game away to other students and, more seriously, compelling the student to make a statement when he may not have the linguistic capacity to do so. On the other hand, Ausubel (1961) takes issue with the Hendrix claims that in the natural order of events the abtraction forms first and then a name is invented for it; he contends that verbalization is an integral part of the abstraction itself.

It is possible to analyze generalizations into logical components. The possibility exists that if students understood these logical components of generalizations, they may have the linguistic capacity to verbalize the generalizations which they have discovered. Such a condition may provide a bridge between the two points of view concerning verbalization since verbalization would be taking place and the language of logic may keep that verbalization from being premature.

It was intended that if it were possible to develop logic lessons which would enable students to precisely verbalize generalizations, this independent study would be followed by a research project using these logic lessons. There are three questions that this proposed research may help answer. Will teaching the logical structure of some generalizations enable students to precisely state mathematical generalizations which they have discovered? For what grade level is this logic unit most suitable? Will gifted students profit more from the study of this logic unit than other college-capable students?

One important reason for developing logic lessons and for doing research with them involves an interest in providing for the needs of gifted youngsters in mathematics. There has been a marked change in the content and pedagogy of mathematics education, and some of the curricular materials prepared to illustrate and implement this change have been written with the college-capable student in mind. Current recommendations for providing for gifted mathematics students essentially involves having them use the modern mathematics materials written for the college-capable. While this is certainly a good recommendation, it still leaves the question, "Are there concepts which may more suitably be taught to gifted students than to other college-capable students?" Research with this logic unit may help answer this question.

Before such research can be attempted it was necessary to develop logic lessons for gifted children and field test these lessons to determine their teachability. These lessons were written for junior high school students because the proposed research will be carried out at this grade level.

A survey was made of contemporary texts which were designed to teach logical concepts to students of high school age and younger. Some programmed materials written for junior high school students were examined. It was assumed that the authors of these works felt that:

1) Their selection of concepts indicates they feel that these concepts are teachable at the grade level for which they were writing.
2) Their order of topics presented represents an orderly, systematic sequence of concepts.
3) Their method of presenting each concept is a desirable, pedagogically sound method.
4) Mechanical details of format represent a desirable format for writing.

(This last assumption is especially pertinent to programmed texts.) By accepting or rejecting these assumptions with respect to each individual text, ideas for writing a logic unit were compiled. A list of these references appears at the end of this paper.

It should be made clear that the content of the logic unit developed entitled, "Sentences of Logic", is a set of concepts drawn from the public domain of logical ideas on the judgement that these ideas are most suitable for the purpose at hand. However, many decisions made while writing were influenced by the acceptance or rejection of ideas gained in the survey. Several specific instances are cited:

1. It seemed desirable to start out teaching the form and truth value of generalizations. But most logic texts present generalizations in the latter part of their book. In fact, Suppes not only delays the treatment of universal generalizations until the last part of his text, but he reserves the treatment of existential generalizations until a second book in his series is produced (1964). However, generalizations appear very early in Hale's book, and he treats both universal and existential generalizations. His success in field testing his text kept me from being discouraged from introducing generalizations early.
2. In writing, the possibility was entertained that the information taught would be of most value to gifted students. A consensus of opinions among many who work with gifted students is that they should be encouraged to work independently. It seemed, then, that programming would be an ideal format. Hale's book is a linearly programmed logic book and Neuhouser's (1964) teaching methods are imbedded in programmed formats. The use of half page sized frames is taken from Neuhouser's format. The instructions on how to use the answer book are essentially the same as Hale's. Even though the student studying this unit marks just the letter of the correct response in his answer book, the entire set of possibilities (including the answer in italics) appear on the next page; this idea is adopted from Hale, who has his answers displayed in green print along with the other possibilities.[1]

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[1] This seems to be an especially desirable pedagogical device when one is attempting to emphasize the form of the sentence. Not only

is the student asked to look for a difference in form when he is asked the question, but he is given a second chance to observe this difference as he checks his answers--this time with the difference emphasized by the different kind of type (or different color of ink).

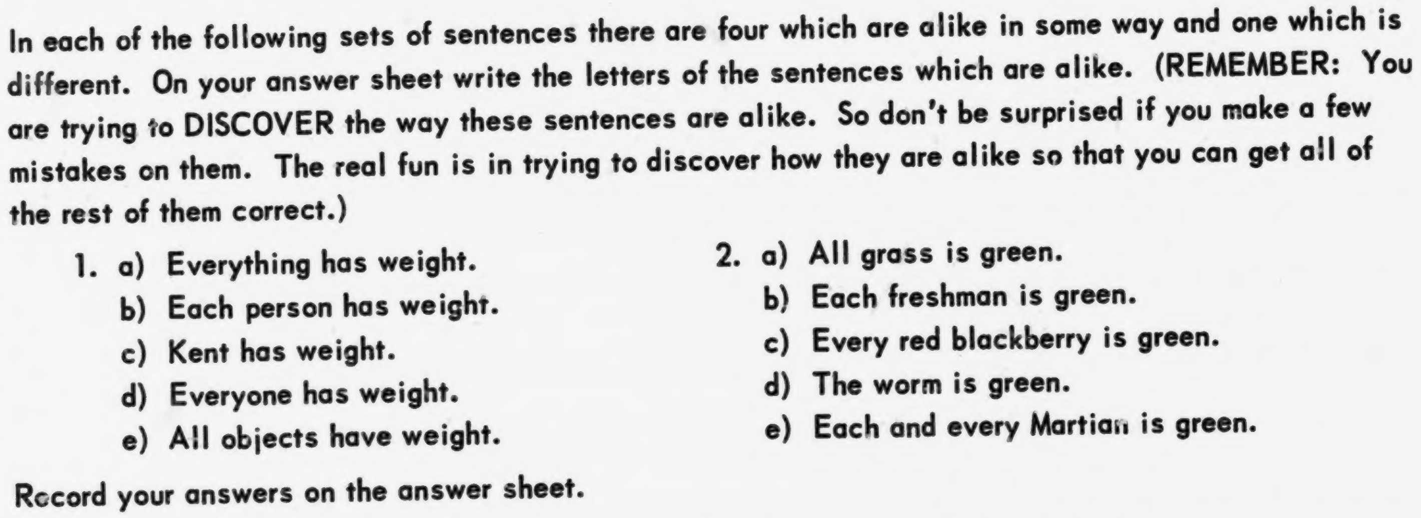
3. It seemed desirable to teach this unit by a discovery method. Allen's, Halé's, and Neuhouser's texts all helped establish a discovery format even though the likeness-difference approach is adopted from my previous use of the same technique in developing materials in mathematics for gifted students in kindergarten and first grade.
4. Hale's distinction between universal statements and universal generalizations and Suppes definitions of predicates and terms are used.

The logic unit itself is not intended to teach logic for its own sake, but rather to give experience with the form and truth value of logical generalizations. In particular, this means this unit does nothing with logical inference in spite of the fact that inference is at the heart of many logic courses. It is written in the form of a linear program. An attempt was made to program a discovery approach following the general pattern of asking for an indication that a similarity or difference has been discovered and reinforcing the guesses until the desired discovery is made. Then the name for the idea is supplied. Only the conventional agreements about names, notations, abbreviations, translations, etc. are not left to discovery.

CONCEPTS IN THE PROGRAM

Following is a list of ideas covered in the programmed unit in the order in which they are first encountered. The teaching of some of these ideas is illustrated with sample frames from the logic unit developed. It should be remembered that these frames are taken from a sequence of frames which are cumulative in nature. Therefore their appearance may seem fragmentary. Only an examination of the entire "Sentences of Logic" program can provide an accurate developmental picture.

1. What universal statements are as contrasted with particular statements. (To illustrate, frames are displayed which indicate that students discover what universal statements are by comparing them with other statements. The frames indicate that the names for these types of sentences are introduced only after experience with them.)



In each of the following sets of sentences there are four which are alike in some way and one which is different. On your answer sheet write the letters of the sentences which are alike. (REMEMBER: You are trying to DISCOVER the way these sentences are alike. So don't be surprised if you make a few mistakes on them. The real fun is in trying to discover how they are alike so that you can get all of the rest of them correct.)

1. a) Everything has weight.
   b) Each person has weight.
   c) Kent has weight.
   d) Everyone has weight.
   e) All objects have weight.

2. a) All grass is green.
   b) Each freshman is green.
   c) Every red blackberry is green.
   d) The worm is green.
   e) Each and every Martian is green.

Record your answers on the answer sheet.

2. A universal statement talks about a universal set. It tells how many elements of the universal set have a certain property.

3. Two universal statements mean the same thing if they have identical universal sets and claim that the same number of elements of the universal set possess the identical property.

4. A universal statement may be written in ordinary English or in a special form. This form of writing it is a universal generalization.

5. a) For employees only.
   b) *For each and every number x, x is an idea.*
   c) *For every husband y, y has a wife.*
   d) *For each action there is a reaction.*
   e) *Any man can think.*

6. a) *For every woman there is a man.*
   b) *Every good boy does fine.*
   c) Forever is a long time.
   d) *For any effect there is a cause.*
   e) *For all numbers x, x is greater than zero.*

* * * * * * * * * * *

The sentences that are alike in each set are called universal statements.

Let us consider three more universal statements:

1) All men have ancestors.
2) No matter what man you want to consider, he has ancestors.
3) For each man x, x has ancestors.

All three sentences express universal statements. The first two are in ordinary English. The last one is written in a standard form. This formal expression of the universal statement is a universal generalization.

In each of the following sets of sentences, indicate the letter of the sentences which are universal generalizations.

5. A universal generalization contains two parts: A quantifier and a predicate (or open sentence).

7. a) For each man x, z is the wrong letter.
   b) ▭ is a frame or ⬭ is a frame.
   c) Of all the sentences I have examined this one is absolutely the most medium sized.
   d) All elephants tell jokes.
   e) Forever is like eternity.

* * * * * * * * * * *

Consider the universal generalization:

For each number x, x is greater than zero.

This generalization has two parts.

One part of a universal generalization indicates what property is under consideration.

In our example the property is "being greater than zero."

This part is called the open sentence or the predicate.

The other part of a universal generalization is called the quantifying phrase or the quantifier. The quantifier tells

what the universal set is

and

how many members of the universal set have the property.

Look again at our sample generalization:

For each number x, x is greater than zero.

The quantifier tells us that the universal set is the set of numbers and that all of them have the property of being greater than zero.

Let us remember that we identify a universal generalization by its form---not by whether it is true or not. The above universal generalization is a universal generalization because it is a universal statement written in a certain form.
It is written with a quantifier and a predicate.

(By the way, can you tell if that generalization is true?)

* * * * * * * * * *

Each of the following generalizations is supposed to have its quantifier underlined once. Indicate the letters of the sentences that are done correctly.

1. a) For any book b, b has pages.
   b) For each class c, c has a teacher.
   c) $a \cdot 0 = 0$, for each number a.
   d) For each number x, x is greater than zero.

6. The equivalence of "each", "every", "any", "all", and "each and every".

7. Translation of universal statements into equivalent universal generalizations.

3. *$\forall$ baby b, b has blue eyes.*
4. *$\forall$ number n, n is an idea.*
5. *$\forall$ man m, m has equal rights.*

* * * * * * *

Continue translating.

6. The product of any number by 3 is the same as the product of 3 by that number.

7. Choose any number. The result of dividing that number by 4 is the same as multiplying it by ¼.

8. Every number is smaller than 9.

REMEMBER THAT IN TRANSLATING we are not interested whether they are true or false; we are just interested in the form of the sentences.

8. Existential generalizations as sentences whose form is similar to that of universal generalizations.

9. Existential generalizations compared with universal generalizations and particular sentences.

10. The equivalence of "there is", "there are", and "some", and abbreviation of existential generalizations.

3. *a) There is a pencil p such that p has hard lead.*
   b) **There is my favorite movie star.**
   c) There is an animal c such that c has nine lives.
   d) There is a gas g with the property that g is lighter than air.

4. *a)* **For some men golf is enjoyable.**
   b) There exists a woman w such that w can knit.
   c) For some child c, c can ride a bicycle.
   d) There is a junior high school student j such that j enjoys logic.

* * * * * * * * * * *

There is an abbreviation that logicians use in existential generalizations. It is the symbol "∃" which is used in place of

"There exists"

or

"There is"

So that

There exists a number x such that $x + 2 = 1$.

or

There is a number x such that $x + 2 = 1$

or

For some number x, $x + 2 = 1$

(1) ∃ a number x such that $x + 2 = 1$

* * * * * * * * * * *

Let us consider two more abbreviations used frequently.

Since the words "such that" appear so often in existential generalizations, the symbol "$\ni$" is used instead of them. With this abbreviation the existential generalization (1) above would be shortened to

$\exists$ a number x $\ni$ $x + 2 = 1$.

The final abbreviation is used by mathematicians who leave out the words "a number" when the rest of the sentence makes it clear that the existential generalization is about numbers.

Now our sentence (1) on page 42 becomes:

$\exists x \ni x + 2 = 1$.

That's almost as condensed as a vitamin pill, isn't it?

* * * * * * * * * *

Let us look at two more examples.

The existential generalization:

There exists a number x such that $x^2 = 2$.

may be written:

$\exists x \ni x^2 = 2$.

And the existential generalization:

For some man m, m has three eyes.

may be written:

$\exists$ a man m $\ni$ m has three eyes.

Would you like to try to write some abbreviations? (You are supposed to say, "Yes!")

Abbreviate the following existential generalizations:

1. There is a number r such that $r \cdot 3 = 1$.
2. For some number s, $s + 1 = 0$.
3. There exists a number t such that $t^2 = 3$.

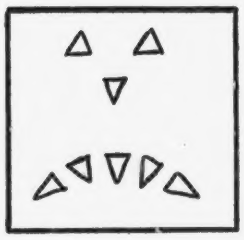
Remember that we are interested in the form of the generalizations not in their truth value.

However it is o.k. to see if you can tell whether or not they are true if you are curious. (Surely curiosity won't affect you the same way as it did the cat!)

11. The similarities of universal and existential generalizations in terms of universal sets and predicates. Their difference in terms of the number of elements in the universal set which makes the predicate true.
12. The truth value of universal and existential generalizations illustrated by considering displayed finite sets of geometric figures.

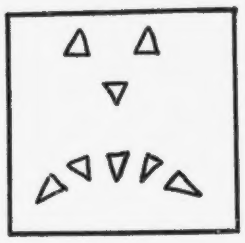
Up to this place we have been interested in the form of generalizations. We have seen that they can be written with quantifiers and predicates. We haven't been interested in whether or not the generalizations were true; we were more concerned with form than truth value. Now it is time to examine the truth value of some generalizations.

Let us take for our universal set the set of figures within the following frame:



On your answer sheet indicate the letters of the generalizations which are true.

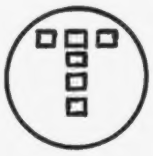
1. a) ∀ figure f, f is a triangle.
   b) ∃ a figure g ∋ g is a triangle.
   c) ∀ figure h, h is not a triangle.
   d) ∃ a figure m ∋ m is not a triangle.



1. *a) ∀ figure f, f is a triangle.*
   b) ∃ a figure g ∋ g is a triangle.
   c) ∀ figure h, h is not a triangle.
   d) ∃ a figure m ∋ m is not a triangle.

* * * * * * * * * * *

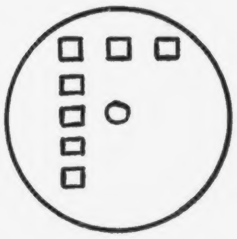
13. It takes all members of a universal set to show a true universal generalization is true.
14. It takes only one member of the universal set to show a false universal generalization is false.



Notice it takes all the figures in the universal set to make the universal generalization true.

* * * * * * * * * * *

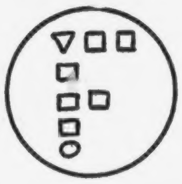
Consider the universal set of figures in the frame and the generalization about it.



(1) $\forall$ figure s, s is a square.

This is a false universal generalization. In the frame on your answer sheet draw all the figures needed to make it false.

Look at this universal set of figures in the frame and the generalization about it.



(2) $\forall$ figure s, s is a square.

This is a false universal generalization. In the frame on your answer sheet draw all the figures necessary to guarantee that it is false.

* * * * * * * * * * *

Let us look at a universal generalization about the universal set of numbers:

$$\forall\ x,\ x + 2 = 2 + x$$

This is a true universal generalization.

1. **Write the numerals for 5 numbers that tend to convince you that this generalization is true.____**
2. **How many numbers does it take to make sure it is true?____**

15. It takes at least one element of the universal set to show a true existential generalization is true.

16. It takes all members of the universal set to show a false existential generalization is false.

17. Truth and falsity of generalizations extended to infinite sets of numbers.

18. Instances of a generalization compared to the generalization itself.

3. $\exists\, n \ni n + n = n \cdot n$

a) $4 + 4 = 4 \cdot 4$
b) $3 + 3 = 2 \cdot 3$
c) $2 + 2 = 2 \cdot 2$
d) $49 + 49 = 49 \cdot 49$

4. $\forall m,\ m + 2 = 2 + m$

a) $3 + 2 = 2 - 3$
b) $7 + 2 = 2 + 7$
c) $\frac{1}{4} + 2 = 2 + \frac{1}{4}$
d) $13 + 2 = 2 + 13$

5. $\forall r,\ r + \frac{1}{2} = \frac{1}{2} + r$

a) $\frac{1}{4} + \frac{1}{2} = \frac{1}{2} + \frac{1}{4}$
b) $(1 + 7) + \frac{1}{2} = \frac{1}{2} + (1 + 7)$
c) $n + \frac{1}{2} = \frac{1}{2} + n$
d) $3 \div \frac{1}{2} = \frac{1}{2} + 3$

* * * * * * * * * * *

The sentences that are like the corresponding generalization are called instances of that generalization. Each generalization listed above has three instances and one sentence that is not an instance.

19. How instances are generated from generalizations.

8. ∀ Dog d, d barks

a) Fido barks.
b) Jumbo barks.
c) Shep barks.
d) Rover barks.

9. ∃ a kitten k ∋ k is white.

a) Whitey is white.
b) Blacky is black.
c) Tabby is white.
d) Tom is white.

* * * * * * * *

The instances which are true are called true instances and the instances which are false are called false instances. (That's logical, isn't it?) However, whether or not a sentence is an instance of a generalization does not depend on the truth of the instance; it depends only on the form of the sentence.

Let's make an instance just to see how they are made.

A. Start with a generalization.	$\forall x,\ x + 5 = 5 + x$
B. Erase the quantifier and leave only the predicate.	$x + 5 = 5 + x$
C. Erase the letters used as placeholders but don't change anything else.	$+ 5 = 5 +$
D. Put in the name of something from the universe each place the placeholders were.	$7 + 5 = 5 + 7$

20. Truth and falsity of instances of a generalization.

21. The relationship between the number of true and false instances of a generalization and its truth value.

22. A summary of the ideas covered in the program up to this point.

2) Consider $\exists$ a man $x \ni$ x lives on Mars.

The part that is underlined is

a) the predicate

b) the quantifier

3) Consider $\exists$ a man $x \ni x$ lives on Venus.

The property the predicate states is

a) being a man

b) living on Venus

c) being alive.

* * * * * * * * * * *

4. A QUANTIFIER TELLS
   A. WHAT THE UNIVERSAL SET IS AND
   B. HOW MANY ELEMENTS OF THE UNIVERSAL SET HAVE THE PROPERTY INDICATED BY THE PREDICATE.

4) Consider: $\exists$ a flea $x \ni x$ lives on Pluto.

a) What is the universe?	b) How many live on Pluto?
(a) the set of fleas	(a) at least two
(b) the set of planets	(b) at least one
(c) the set of dogs	(c) all

23. Predicates of generalizations compared to instances of them.

24. Predicates of logic as sentences compared to predicates of English grammar as building blocks of sentences.

25. The nature of the pronoun in a logical predicate. Its use as a placeholder for a noun.

26. The impossibility of assigning a truth value to a predicate.

Field Testing

The program "Sentences of Logic" was field tested during the period from May 19, 1965 to May 27, 1965 in a class of 24 gifted students. These students were in a combined 5th and 6th grade class in Kenwood School, Champaign, Illinois. Mr. Carl Tausig was the teacher. The program was written with college capable junior high school students in mind. Field testing it in a gifted 5th and 6th grade class should bring to light any vocabulary problems that the junior high school student would encounter. Answers to the following questions were sought:

1) Can the students successfully complete the program?
2) How much time is required to complete the program?
3) What information can be found that may be used to revise and improve the program?

Each student worked at his own pace during a time set aside for the entire class to work on the program. He was free to ask questions and the teacher circulated among the students during each session. The time needed to complete the program, according to the student's own report, ranged from 140 to 205 minutes with a mean time of 165.6 minutes and a standard deviation of 23.4 minutes.

An examination of response booklets confirmed that no one failed to successfully complete the program. As explained to students in the booklet, it is intended that mistakes be used to teach, and the student is told that mistakes are all right in the first few exercises of a set as long as he "catches on" before the end of any series of exercises. No student failed to "catch on" before the end of any series of frames.

It is anticipated that an extension of this "Sentences of Logic" unit be written so as to include statement of generalizations involving relationships among several variables and a discussion concerning the dependence of the truth value of numerical generalizations on the set of numbers used as a universal set.

This expanded version of "Sentences of Logic" would seem to contain enough of the components of the language of generalizations so that students would know how to adequately state the generalizations they discover. This verbalizing skill should be a desirable tool in the intellectual tool box of any student--especially a gifted student who is encouraged to work independently of his teacher and classmates. The research planned using this unit should provide some indication of how effective the use of the "Sentences of Logic" unit would be.

This "Sentences of Logic" unit should contribute equally to the field of mathematics education. Many persons in mathematics education are offering different opinions about how much verbalization to expect from students. It reminds us of a story illustrating how the scientific method had to compete with the firm grasp that the deductive method had on those seeking the truth about the natural world. It was reported that learned men would debate for hours on how many teeth were in a horse's mouth--and they never even considered the possibility of looking into a horse's mouth and counting! Perhaps, some specific instruction in the language necessary to verbalize correctly can provide a similar practical conclusion to the debate about how much verbalization may be expected.

Primary Grades

Situation	Objective
Share a game - Think of a game you play with your family or friends. Teach it to some of the children in the class. Bring with you anything you need to play the game.	A game has a set of rules. If you change the rules, you change the game. If you break the rules you can't play the game at all.
You are a special person. There is no one else in the world exactly like you. There will never be another person exactly the same as you.	Self-concept
How are we alike? Are there ways in which we are alike?	Physical and social needs
Are there times when we need the help of other people?	Cooperation Sharing
Are there times when we use the work of other people?	
times when we do not use the work of other people?	Independence Cheating
All of you come to school neatly dressed, etc. Do you suppose there are places in the world where people think it is not good for little children to look pretty or handsome? Someone told me that in the Middle East mothers and fathers do not want children to look attractive because they are afraid someone will steal the child or cast an evil spell on him. Do you think this might be true? How could you find out?	Cultural differences People act according to their beliefs.

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